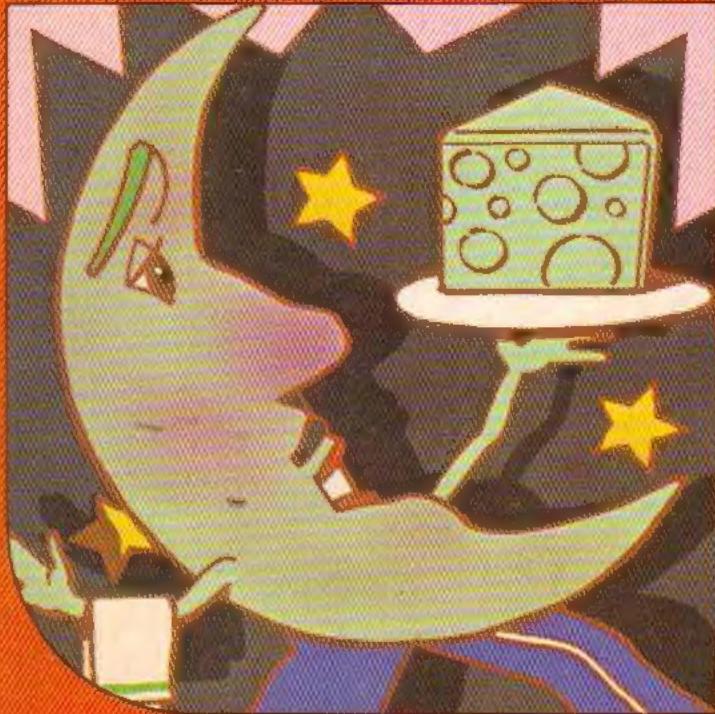
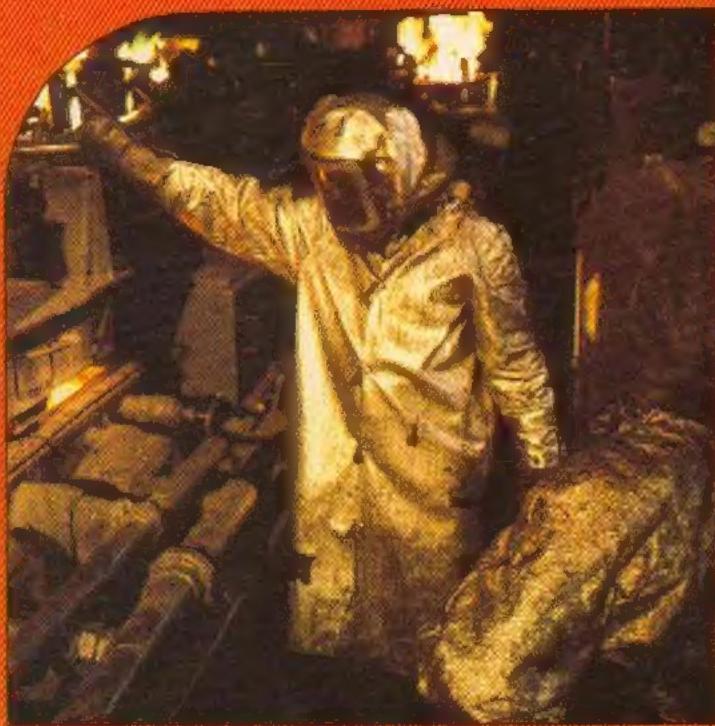
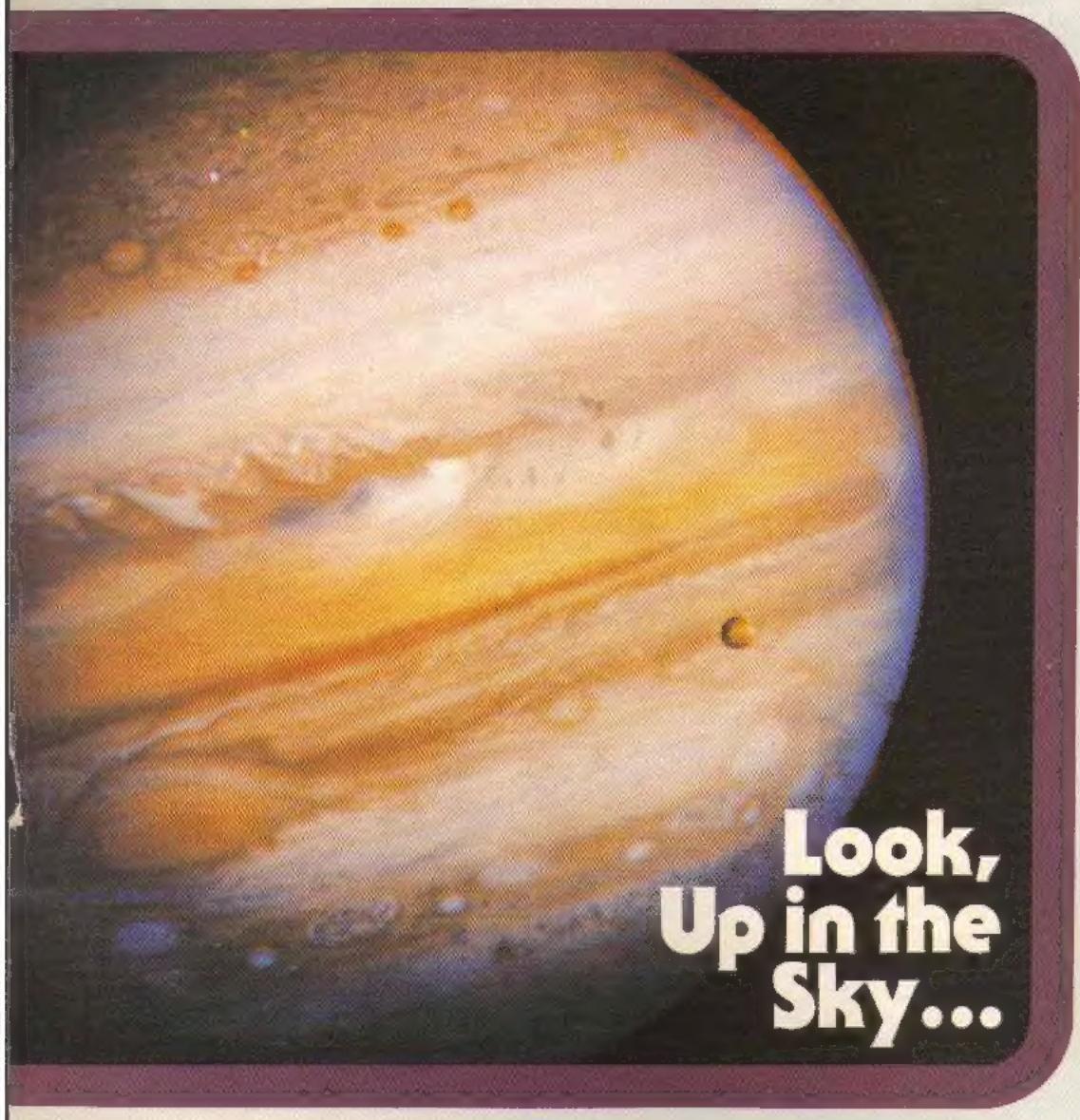


321 CONTACT

Inside: A Visit to a Money Factory!





Look, Up in the Sky...

And you just might see Jupiter, the solar system's largest planet. Of course, you won't see it quite like this. But you can spot Jupiter—and lots of other sky sights—if you just know when and where to look.

To help you find Jupiter—as well as Venus, Mars, Saturn, shooting stars and more—this issue of CONTACT has a poster of sky events. It's a month-by-month guide to what's happening in the sky for the next year—and how you can see it.

To find your sky calendar, turn to page 20.

Publisher
Nina B. Link

Editor
Andrew Gutelle

Art Director
Al Nagy

Managing Editor
Aury Marrero

Associate Editor
Joanna W. Foley

Assistant Editors
Rebecca Herman
Renée Skelton

Assistant Art Director
Bob Sullivan

RESEARCH

Research Director
Jane Clarke

Researcher
Brian Allen

BUSINESS

Circulation Director
Kate B. Spector

Production Manager
Carole N. Crosbie

Subscription
Fulfillment Manager
Lucille Friedman

Production Coordinator
Linda Manes

Promotion Coordinator
Patricia E. Giassa

ADVISORS

Dr. Gerald S. Lesser
Professor, Harvard
Graduate School
of Education

Dr. Charles Walcott
Director, Lab. of Ornithology
Cornell University

Dr. Jeani Walker
Professor of Physics,
Cleveland State University

Dr. Charles A. Whitney
Professor of Astronomy,
Harvard University

CHILDREN'S TELEVISION WORKSHOP

President
Joan Ganz Cooney

Executive Vice President
Paul B. Fristenberg

President
CTW Products Group
William F. Whaley

Senior Vice President
Corporate Affairs
David V. B. Britt

Vice President
Executive Producer
David D. Connell

Vice President
Finance and Administration
C. Sue Cushman

Vice President Community
Education Services
Evelyn P. Davis

Vice President
Public Affairs
Robert A. Hatch

Vice President
Production
Alfred Hyslop

Vice President
Research
Dr. Edward L. Palmer

3-2-1 Contact (ISSN 0165-4105) is a publication of the Children's Television Workshop, published ten times during the year monthly except for January and August. ©1982 Children's Television Workshop. All rights reserved. All contents owned by the Children's Television Workshop and may not be reprinted without permission. 3-2-1 Contact is a trademark and a service mark of the Children's Television Workshop. Printed in the U.S.A. Number 25 April 1982
Editorial offices: Lincoln Plaza, New York, N.Y. 10023. Send subscription orders and change of address notices (including label from cover of magazine) to 3-2-1 Contact, P.O. Box 2933, Boulder, Colorado 80322. Subscriptions, 1 year, U.S.A. \$10.95; Canada and other countries \$13.95. Bulk copy rates to schools and other institutions available on request.

Page 4



Page 10



Page 16



Page 18



Page 22



Page 24



Page 8



021 CONTACT

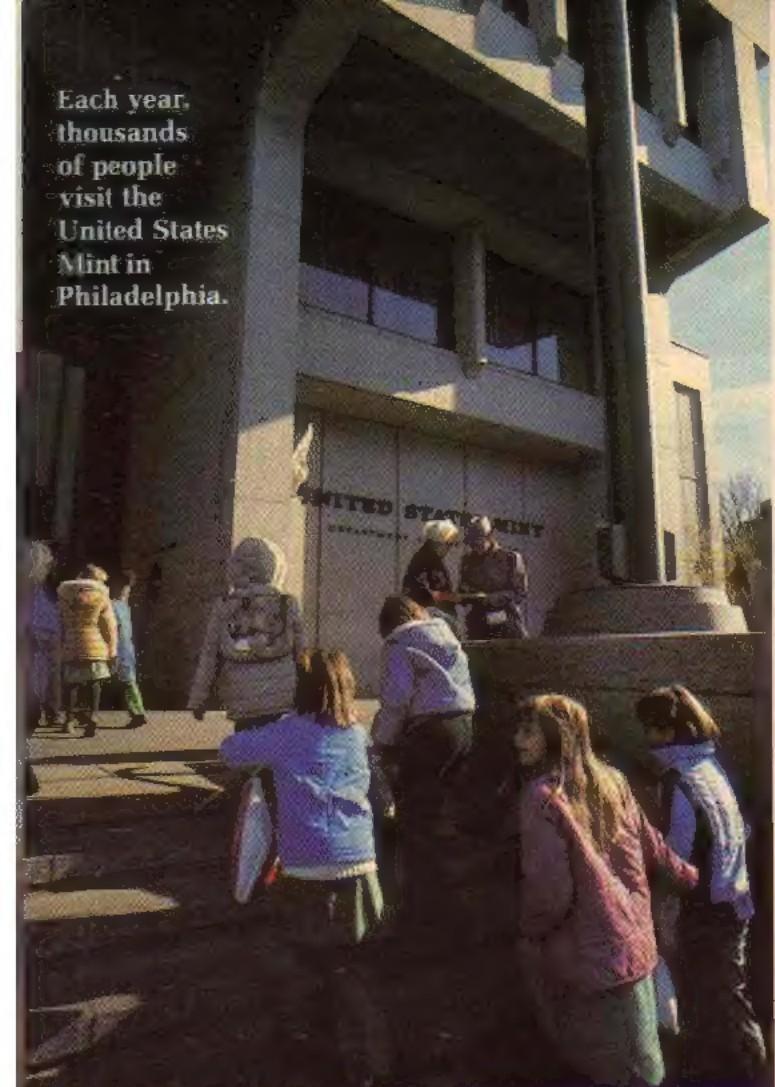
Featuring This Month

- 4 The Money Factory: Making Change at the Mint**
- 12 The Bloodhound Gang: The Case of the Whispering Pirate (Part One)**
- 20 Sky Sights: A CONTACT Poster**
- 22 This Quiz is for the Birds!**
- 24 Super Spring Special**

Plus Our Regular Departments

- 8 Factoids**
- 10 Contact Report**
- 15 Experiment: Cloud in a Jar**
- 16 List of the Month: Crazy Cash**
- 18 Any Questions?**
- 30 Timeline: Calculators**
- 32 Mail**
- 34 Reviews & Previews**
- 36 Do It!: Calculator Puzzles**
- 37 Did It!: Answers**
- 39 Earth Works: Tornadoes**

Each year, thousands of people visit the United States Mint in Philadelphia.



THE MONEY

Everyone has heard of peppermint and spearmint. But there's another kind of mint that doesn't come in a candy wrapper. It is the United States Mint. This mint is a factory where coins are made. That's right, a money factory!

Pennies, nickles, dimes, quarters, half dollars and the Susan B. Anthony dollar—all the coins that you spend or save—usually come from two main mint offices. They are located in Philadelphia and Denver. In addition to coins, these mints make special medals at times to honor a famous person or a special event.

The Philadelphia Mint is so big that it covers one square city block. Inside this gray building, 30 million coins can be made each day. Even though most of them are pennies, that adds up to big bucks. If you had all this money, you could buy yourself a brand new car a day for a whole year!

If you want to see just how a money factory works, you can go to visit this mint. Inside the front door, you'll step onto a long escalator. Along with other visitors, you'll ride up over the lobby to a special glass-covered walkway. From here, you can look out over a huge room below. Hundreds of busy workers are running giant money-making machines.

Making Millions of Pennies

All coins are made from huge hunks of metal. Actually, pennies are a mixture of two metals—copper and zinc. This mixture, or alloy, must contain just the right amount of each one. So first the metals are carefully weighed.

Right: Workers near the mint's furnace wear special clothes to protect them from the intense heat.

Left: This is the view most visitors have of the mint. They watch the action from a special glass-covered walkway above the main floor.

It may be hard to imagine putting metal in an oven, but that is exactly what happens next. The metals are heated together in a huge furnace. Because this room is very hot, the workers here must wear silvery suits made of aluminum. These suits protect them from the hot furnace. The suits also make the workers look a little like astronauts.

The metals are heated until they melt. Then the furnace tilts and pours them into a mold like a giant candy bar. When the metal cools off, it takes on the shape of the mold. This huge chunk of metal is 18 feet (5.4 m) long and weighs about 6,000 pounds (2,700 kg). It is known as an ingot (IN-get).

Next, a big electric saw cuts the ingot in half. The two slabs must be heated again so they will be soft enough to work with. They're popped into a big toaster called a reheat furnace. Each slab is red-hot and glowing like fire when it comes out of the furnace. "You could fry eggs on it," says Eleanor McKelvey, a mint worker.

Rolling Pennies

Next, the hot slab goes to the rolling mill to be rolled out almost like pizza dough. After 11 ➤



Above: Copper is one of the metals used to make pennies. It must be melted and mixed with zinc.

FACTORY

MAKING CHANGE AT THE MINT

by Mary Ann Castronovo

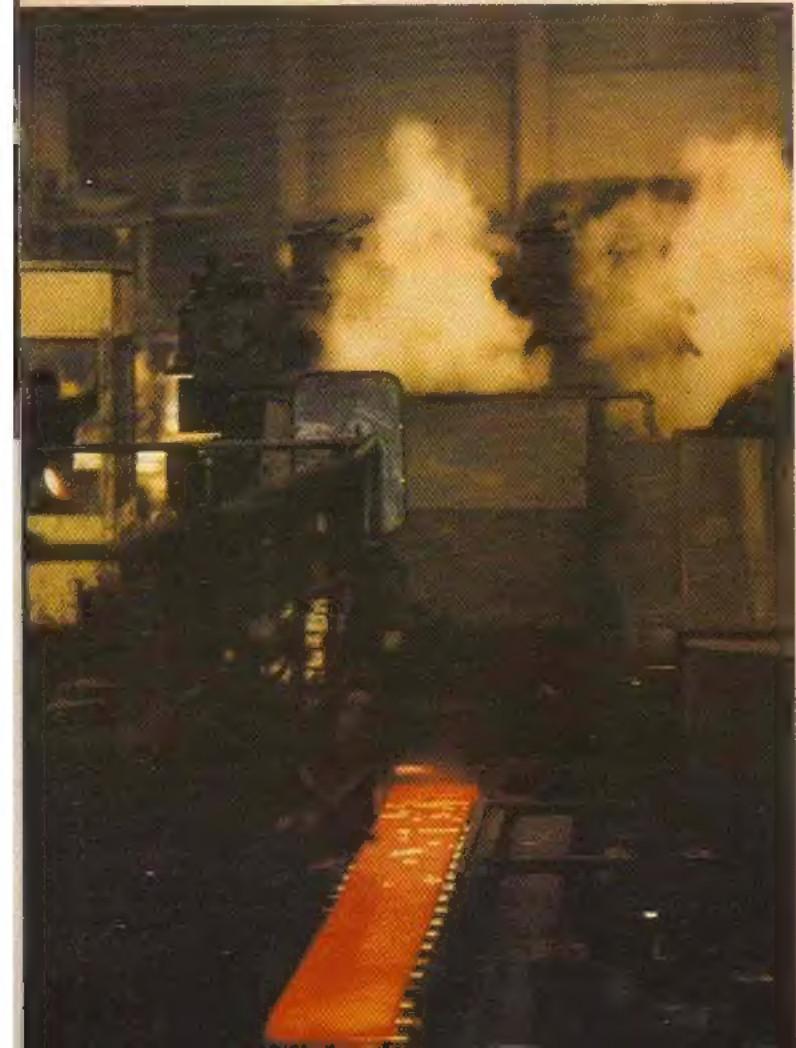


The melted copper and zinc mix is poured into molds to make bars.



Right: Stacks of metal bars, called ingots, are piled up in the mint. Each bar is 18 feet (5.4m) long and weighs 6,000 pounds (2,700 kg).

Below: Each ingot is reheated till the metal is soft. Then these red-hot bars are flattened out.



squeezes through the mill's rollers, the slab is just one half inch thick, but a whopping 114 feet (34 m) long. That's longer than a basketball court!

The long metal strip is very hot now. To cool it down, it's sprayed with water. Then the top and bottom of the strip are shaved off to make it super smooth. All the metal shavings must go back to be used all over again. Nothing ever gets thrown out in the money factory!

The metal strip is so long that it is becoming hard to carry around. So it is sent to another machine that simply rolls it up until it looks like a giant roll of shiny copper ribbon. Then it is unrolled again and put through more rollers. Finally, it is flat as a penny and 800 feet (240 m) long.

Now it's time to cut out the pennies in a machine something like a big cookie cutter. The blanking press punches out round blank coins. As they fall out of the machine, they sparkle like glitter.

All the blank pennies are dumped onto a net with penny-sized holes in it. Blanks made with the wrong shape or size fall through the holes. That's how the mint makes sure that all its pennies are just the right size. Finally, the good blanks are cleaned with a secret chemical solution until they're shiny as gold. They're also polished and dried.

Then it is time to add the design that makes a

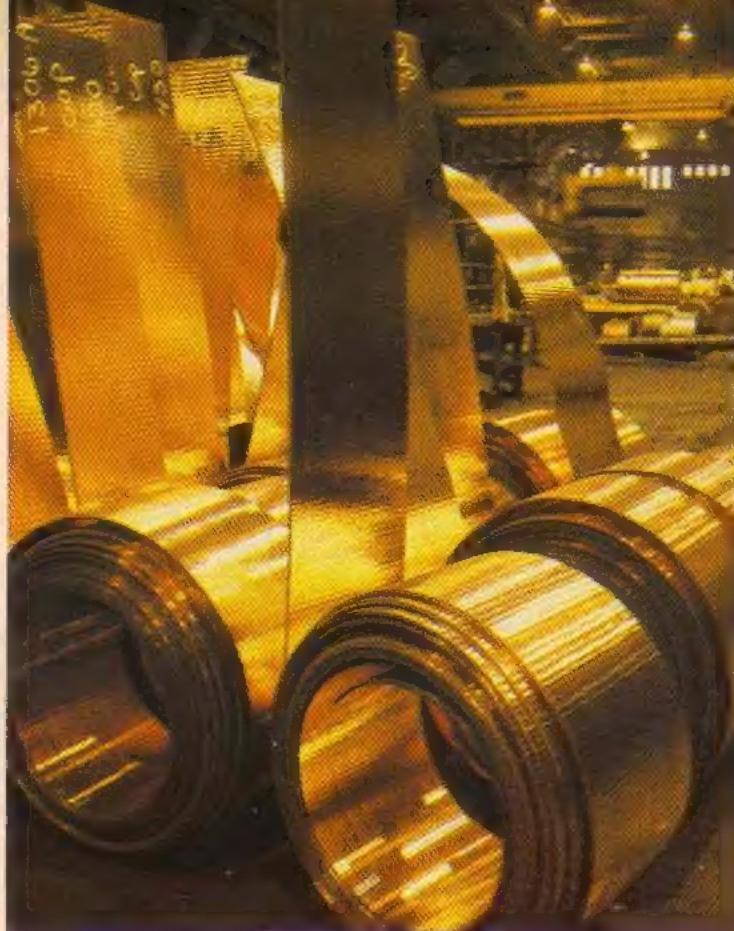
Right: The flat metal coils are 800 feet (240m) long and look like rolls of shiny copper ribbon.

penny look like a penny. Each blank goes into a special mold called a die that stamps the heads and tails designs on at the same time. On top is a picture of President Lincoln. On the bottom is the Lincoln Memorial. At last, the piece of metal is a real penny.

Then it is time to count the pennies by machine (two times, just to be sure) and put them into cloth bags. Each bag is filled with 5,000 pennies and then tightly sewn shut. The next stop for the new pennies is a bank. And from there, they go to you.

A Dangerous Job

Did you ever imagine that making coins took so much work? But it's a lot easier—and safer—to make them now than it used to be. In 1792, when the mint first opened, horses were used to help the workers make the machines move. Now the people who work in the mint get lots of help from electric machines and even computers. But all the same, the machines can be very dangerous. The workers who run them wear goggles to keep the sharp hot pieces of metal from flying into their eyes. They also wear safety shoes to protect their feet from falling objects.



Sometimes they even wear hard hats. And it's so noisy in the mint that all the workers have to wear ear plugs. Some even wear ear muffs!

Lucky for visitors, they don't have to wear safety clothes. The glass-covered hallway protects them from heat and noise. So, if you're in Philadelphia, go visit the mint. It doesn't cost any money to get in to watch your money being made. And best of all, this mint won't give you any cavities.



Above Left: At last it's time to make pennies. The copper coils are now cut into penny-size pieces. The blank coins sparkle like glitter as they pour out of the machine.

Above: The pennies have been stamped with a picture on each side. Finally, they are poured into bags, which will soon end up in banks across the country.

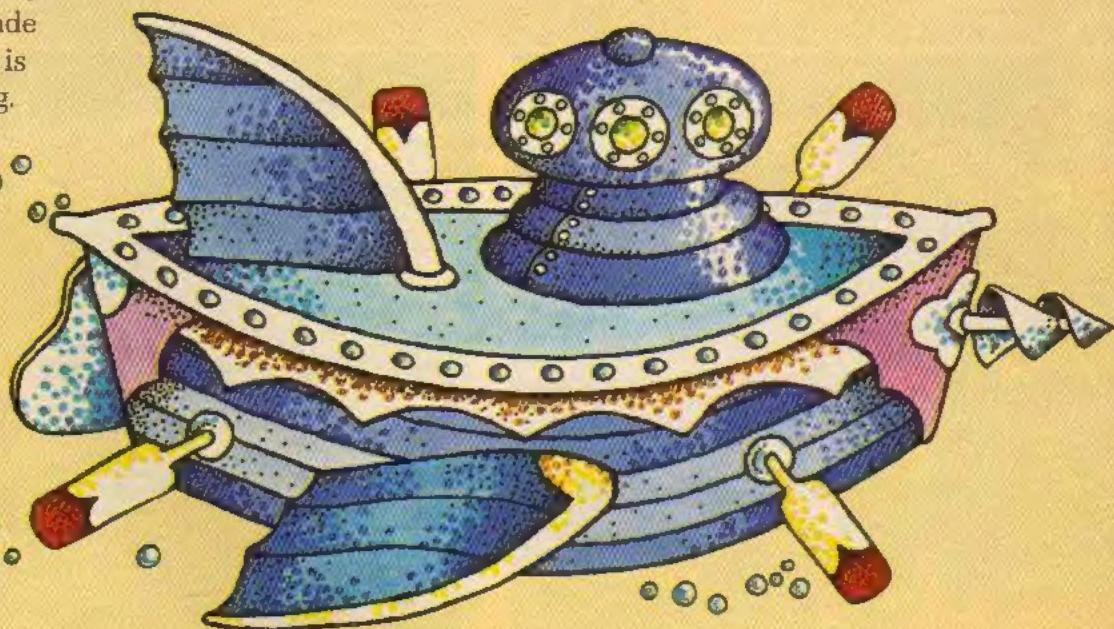
Factoids



A cocoon spun by a silkworm is made of a thread that is a half-mile long.



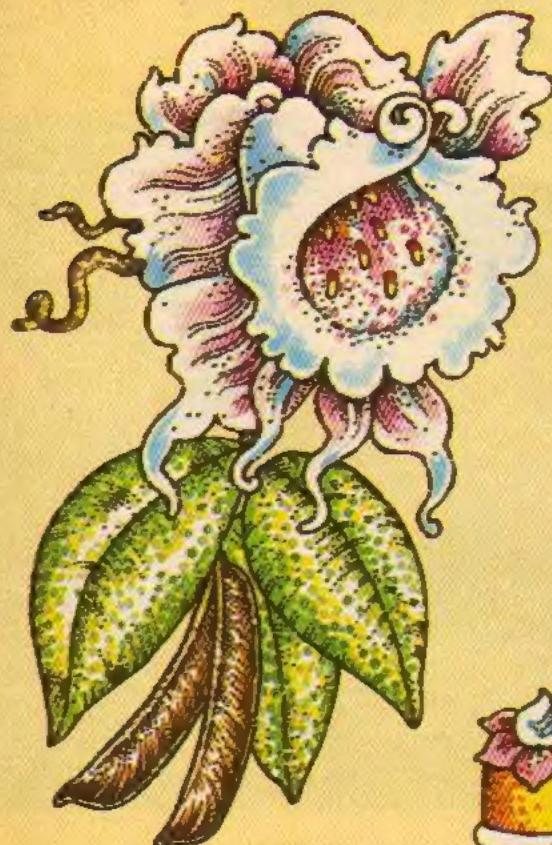
Nearly one third of the earth's land is covered by deserts.



The submarine was invented over 250 years ago by Cornelius van Drebbel.



The United States produces 62 billion cans every year.



Natural vanilla comes from beans which grow on orchid plants.

You have about 10,000 taste buds in your mouth and throat.



Starfish have been found that have as many as 25 arms.



Contact Report

Say Cheese! A camera goes with film like a hamburger goes with a bun, right? Well, not any more. Now a new camera called the Mavica doesn't use film at all.

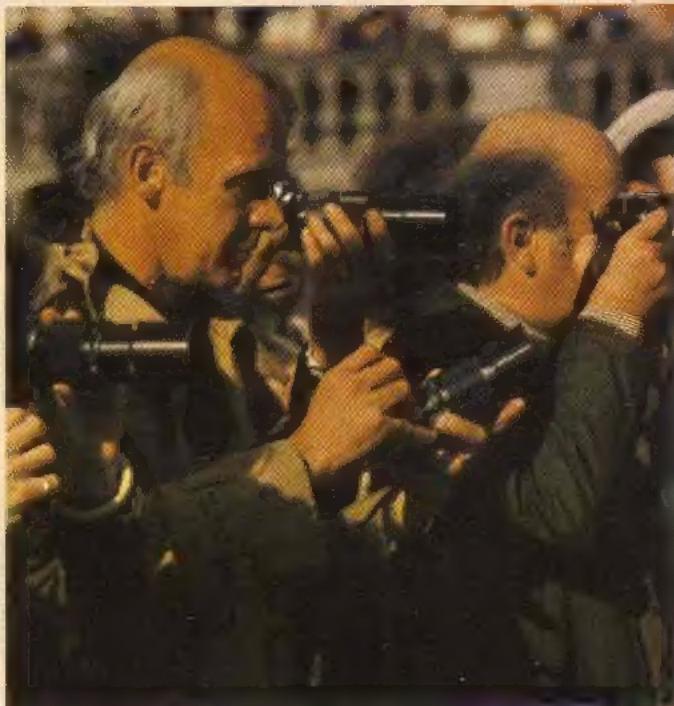
If you take pictures with the Mavica, you don't get snapshots, either. Instead, you can view the results of your photo snapping on your TV screen.

The Mavica comes from the Sony Corporation in Japan. It has a gadget inside that turns a picture into an electrical message. Then that message is recorded on a small magnetic disk. It is a little like the way a tape recorder uses tapes to record sound.

After you take lots of pictures, the disk gets filled with photo messages. Then it can be put in a special player which makes the pictures appear on your TV.

The Mavica will appear in American stores this year. Sony says it will cost about \$900, however. So don't count on seeing your photos on TV anytime soon.

—Written by Suzanne Martinucci



Will your photos soon be on TV?



The arrow points to a pigeon hitching a ride on a rescue job.

Pigeon Patrol Pigeons use their wings for flying. But now a few of these birds are getting around by helicopter instead. They are flying high to help the Coast Guard rescue people at sea.

The birds are being trained to spot the color orange. That's the color of all life jackets. The pigeon sits in a special box below the helicopter. After the aircraft takes off, the bird goes on alert. When it spots something orange, it pecks a button. This sets off a signal inside the helicopter. The pilot follows the signal to the orange object. Hopefully, that's a person in a life jacket waiting for help.

Why send a pigeon to do a person's job? These birds have excellent vision. They are particularly good at spotting colors. So the birds are better at this job than people!

Project Pigeon is still in the test stage. If the "eagle-eyed" pigeons continue doing a good job, soon they'll be used in real rescue missions.

—Written by Michele Lyons

Contact Report

Curly Creature Most animals travel by walking, hopping, flying or swimming. Now a biologist has found a critter that moves along by rolling.

According to Roy Caldwell, the animal is a small shrimp that lives on sandy beaches in Central America. Its three pairs of legs are too weak to support this animal's long, skinny body. So it travels by curling up, tail to head, and turning backward flips.

Most of the time, these animals live underwater in narrow sand tunnels. But when waves wash them out of their homes, they land on the beach. The only way to get back to the water is by rolling.

Caldwell says these little shrimps are the only animals that can roll on a flat surface or even uphill. He found out the hard way. Every time he put the animals under his microscope, they disappeared. To his surprise, they were trying to escape by rolling down the table!

—Written by Michele Lyons



This animal travels by turning backward flips.



The Water-Jel blanket could save you in a fire.

Cool Blankets Blankets usually keep you warm. But now's there a new one that keeps people cool instead. It could even help you walk through a blazing fire!

The blanket, called the Water-Jel, sounds like it should be made from some new wonder fabric. But it is plain old wool. What makes this blanket special is the milky white gel in which it is soaked. The gel comes mostly from cooling oils and powders from plants.

In a fire, the gel on the blanket's outside hardens. The gel blocks heat from getting in. At the same time, the gel on the blanket next to the skin keeps the body wet and cool. It helps people escape unhurt from flames.

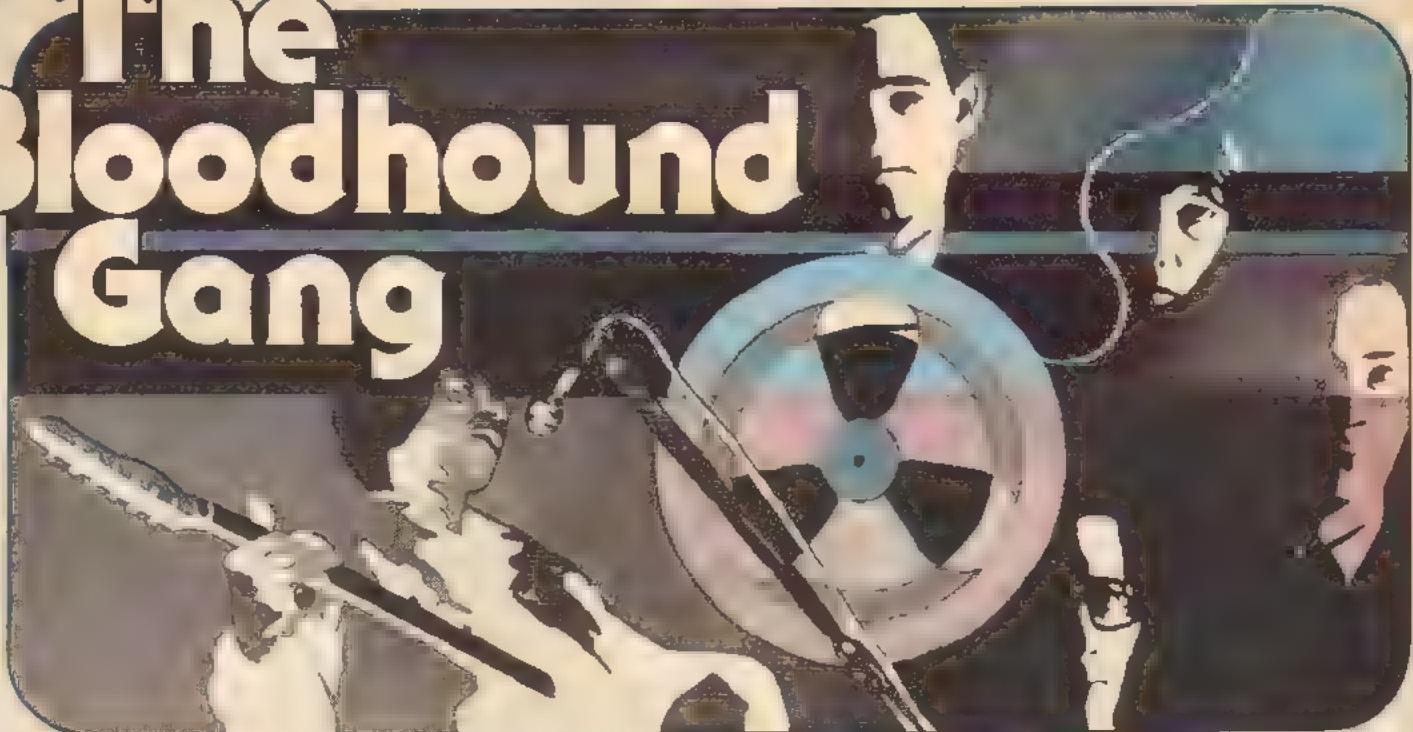
Even when people already have been burned, the blanket can be used as first aid. "The Water Jel's 'super-wetters' soak through clothing and skin and get to the burned areas," says Cary Trilling, the person who makes these blankets.

—Written by Michele Lyons

What's That? Have you seen a story in a newspaper or magazine that belongs in the *Contact Report*? Why not cut it out and send it to us? Be sure to include your name, age, address and the place you found the story. Send it to:

The Contact Report
P.O. Box 599
Ridgefield, NJ 07657

The Bloodhound Gang



The Case of the Whispering Pirate

Part One

Vikki, Ricardo and Zack, otherwise known as the Bloodhound Gang, hurried down the street. They were headed for their office at the Bloodhound Detective Agency.

"\$2.95!" called a street seller. "Buy the Sound Waves' new smash album for only \$2.95!"

"Either those records have nothing to do with the real Sound Waves, or there's something wrong with them," said Ricardo. "Every store around here is charging at least six dollars for that album."

"Well, I don't care what they charge," Zack chuckled. "As far as I'm concerned, sound waves are free!"

"Very funny!" said Vikki. "We're not talking about 'sound wave' sound waves, you know. We're talking about the rock group, the Sound Waves."

"I know what you're talking about," said Zack. "But even the rock group makes use of sound waves. Don't you know how sound waves work?"

Ricardo and Vikki looked at one another.

"Aw, come on," said Zack. "You'll like it once I get started."

"Go on," groaned Vikki. "I have a feeling you'll wind up telling us anyway."

by Madeline Sunshine

"Right," Zack agreed cheerfully. "See, sound waves are caused by vibrations. Take what happens when you play the guitar, for instance. You pluck a string, it vibrates. The vibrations push against air molecules. These air molecules push against other air molecules which push against other air molecules, sending a whole bunch of waves out in every direction."

"Yeah, so?" said Ricardo, as they walked inside their office building and started up the steps.

"Well, those waves are sounds in search of a way to be heard," Zack explained. "What they're looking for is a nearby ear. As soon as they find one, bingo! You've got talking or singing or guitar playing or whatever. I mean, you've got sound."

"We certainly have," said Vikki, as she quickly unlocked the office door. "And it's coming out of that telephone. Would one of you please get it?"

"Bloodhound Detective Agency," said Ricardo. "Whenever there's trouble, we're there on the double. What? You're kidding. Of course! We'll be there in a couple of minutes. Bye!"

"Who's kidding? Where will we be in a couple of minutes?" Vikki demanded.

"Yeah, what's going on?" Zack chimed in.
"Well, I'll give you a hint," said Ricardo. "Believe it or not, it has something to do with sound waves. Come on. We've got an appointment with an old family friend."

The Scene of the Crime

Ricardo led Vikki and Zack downtown to Sound Appeal, the biggest recording studio in the city. There, waiting for them, was Ricardo's friend Tom Kellogg, owner of the studio.

"Hey man, good to see you," he said, shaking Ricardo's hand. "I'm glad you could come on such short notice," he continued, greeting Vikki and Zack. "The situation here is getting serious."

"What situation?" asked Vikki.

"It's not really safe to talk out here," Tom said. "Come into Studio B, and I'll tell you all about it."

The Bloodhound Gang followed Tom into a small room filled with the most up-to-date recording equipment. Taking up most of the room was a huge control board. In front of the control board was a glass window which looked out onto a larger room. This room was set up with microphones, headsets and musical instruments.

"The problem," Tom began, "is pirating."

"Pirating!" exclaimed Zack. "You mean like Bluebeard and Long John Silver?"

"Not quite," Tom replied. "The pirates I'm talking about don't steal gold and silver. They steal tapes of famous groups performing their latest songs. Then they make records out of these pirated or stolen tapes and sell them illegally."

"Hey, wait a minute," said Vikki. "Maybe the street vendor we saw today was a pirate. He was selling a Sound Waves album awfully cheap."

"Right," said Tom. "The Sound Waves recorded that album here just a few months ago. It was the first pirated album I found out about."

"Have you gone to the police yet?" Vikki asked.

"No, I can't," Tom answered. "I haven't even told the people who work for me. If word gets out about the pirating, no group will want to record here. That's why I need your help."

"You've got it," the Bloodhound Gang agreed.

"Good," said Tom. "Then where do we begin?"

"At the beginning," said Ricardo, as he took out a pad and pencil and began to take notes. "First, why don't you tell us what these tapes that are being

pirated look like."

"I'll do better than that," said Tom. "I'll show you. See that oversized, 15-inch reel on the tape recorder closest to Vikki? Well, that's it—that's the master."

"I'll bite," said Zack. "What's a master?"

"Aha!" chuckled the man. "I think it's time I gave you Tom Kellogg's crash course on cutting a record. Sound Appeal," he began, "is called a 24-track studio. That's because this control board can divide the recording tape we use into 24 separate layers, or tracks. A different voice or instrument can be recorded on each of these tracks. Sounds are recorded through microphones which are hooked up to the control board. A singer, for example, sings into a mike. The control board transfers the sound waves created by the singer's voice into a tape recorder. It records them onto one of the 24 tracks. A second track might be used for piano, a third for drums, and so on, until all the instruments and voices needed to complete a song are recorded."

Making a Master

"The result of this entire process," the man went on, "is an unedited master. Master means original. In other words, it's not a copy. Unedited means all the separate tracks have not yet been blended together. The process of blending the tracks is called mixing. During the mix, the control board is used to make some tracks louder and others softer; some tracks may even be dropped."

"The result of the mix is a final tape called the edited master or just plain master. This is the tape that records are made from. It's also the tape our pirate has been borrowing to make the illegal albums."

"Borrowing?" questioned Vikki.

"That's right," said Tom. "Each tape seems to disappear for a few hours. Then suddenly, it shows up again, as though it had never been gone."

"Sounds like an inside job," said Zack.

"Where do you keep the masters?" Vikki asked.

"I have them locked up in a cabinet in the studio," said Tom. He pointed to a spot on the other side of the glass window.

Ricardo leaned over the control board for a better look. As he did, he accidentally hit one of the switches. A red light went on, but nobody noticed.

"Don't strain," said Tom. "Follow me. I'll ➤

show you the cabinet from close-up."

Tom and the Bloodhound Gang walked out of the control room and into the studio.

"Hey, how come the walls in here are all carpeted?" asked Ricardo.

"To keep sound waves from bouncing around," said Tom. "The carpeting helps absorb sound waves that you wouldn't want recorded on tape. Without carpeting, you might wind up hearing echoes."

Tom unlocked the tape cabinet. Then Vikki, Zack and Ricardo began examining it for clues.

"Who, besides yourself, has a key to this cabinet?" Vikki asked.

"My four engineers," said Tom, "Louis, Mathew, Stacy and David."

"Okay," said Vikki. "You'd better tell us a little about each of them."

The Four Suspects

"I'm not sure what there is to tell," said Tom. "First, there's Stacy. She started here last year. Two months ago she asked for a raise. Unfortunately, I couldn't give it to her, and she's been kind of unhappy ever since. Mathew's been here next to the longest—four years. Just recently, he began asking to do as much overtime as possible. Oh, and yesterday, he asked me if he could have a leave of absence starting next month. Louis came here six months ago from Track Two Studios. See, they discovered pirating over there, too. They lost so much business, they had to lay off people. Then there's David. He's been here eight years, but he won't be here much longer. He gave notice a month ago because he's opening a studio of his own."

"Whew!" said Ricardo. "According to what you've told us, each engineer certainly has a motive for pirating the masters. We're going to have to question all of them as soon as possible."

"No problem. I'll arrange it for after lunch," said the man.

"Hey," said Zack, who had wandered off. "What's this funny little closet for?"

"It's not a closet, but a sound proof booth. It's used to record vocals," Tom said. "Would you three like to try it out? You could hear what you sound like on tape. We still have an hour before everyone comes back from lunch."

"Sure. That would be great," said Ricardo.

They all piled into the soundproof booth.

"Boy, it's pretty tight in here," said Zack.

"This booth is really designed to hold no more than three people," Tom replied. After I adjust the mike for you, I'll go into the control room. Then you'll be more comfortable. I'll also turn on the air conditioner. Otherwise there won't be any air circulating, and you won't be able to breathe."

Tom began to lower the microphone so it would be at the right level for the three detectives. But, suddenly, before he had time to finish, the studio went dark. Then, a door slammed shut, and a lock clicked into place.

"Hey, what's going on here?" said Vikki. "Who turned off the lights?"

"I'm not sure," said Tom. "But the same person locked the door to this booth. We can't get out!"

"Oh no!" said Ricardo. "We'd better start yelling for help. There's hardly any air in here."

"Save your breath," said Zack. "The booth is sound proof, remember? No one will hear us."

"I guess we'll have to wait until someone comes back into the studio and sees us," said Vikki.

"That could be a problem, too," Tom said sadly. "See, no one's scheduled to use this particular studio until tomorrow. And," he added, "with so little air, I'm not sure we can last till then!"

Will Tom Kellogg and the Bloodhound Gang get out of the soundproof booth in time?

To find out, read Part Two of "The Case of the Whispering Pirate," in next month's issue of 3-2-1 CONTACT.



Experiment

Cloud in a Jar

On page 27, you will see how clouds affect spring weather. But first, we're going to show you how to make a cloud—right in your own home. No fooling!

What You Need

very hot water (from tap) a flashlight a glass jar
a tray of ice cubes a dark room

What You Do

1. Carefully pour hot water into the jar until the water is about one inch high.
2. Place the tray of ice cubes on top of the jar.
3. Turn off the lights.
4. Shine your flashlight through the jar. If you look very carefully, you should see a little cloud

form in the center of the jar.

Why It Works

Real clouds are made of tiny particles of water or ice. They form when water rises into the air as water vapor.

The higher this gas rises, the colder the air gets around it. When the temperature is low enough, the rising water vapor condenses. That means it turns from a gas back into tiny drops of liquid water (or if it's really cold, ice). The drops of water and ice are the clouds that you see in the sky.

The same things happen in your jar. Water vapor rises out of the hot water at the bottom. But the ice cubes make the air at the top of the jar much colder. When the warm water vapor meets the colder air, it condenses into tiny drops of water that you can see. Instant cloud!



List of the Month

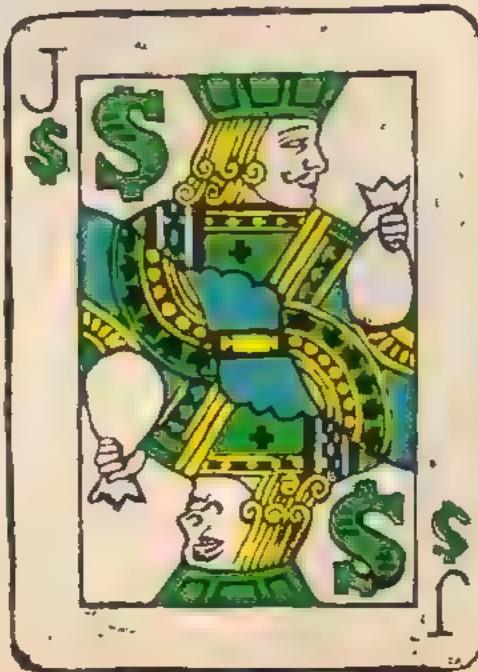
Crazy Cash

by Joanna Foley

People used to cut coins into pieces to make change. Here are other true stories about the history of money.



Wild Jack In 1685, the Canadian territory ran out of money. The French governor there saw soldiers playing cards. He took the cards, signed them, and gave each card a money value. The cards were to be used until real money came from France. But people liked this new money. They wouldn't trade it in. On a dull day, they could always pull out their savings and have a game of cards!



Useful Money Metal money isn't always round. About 2,500 years ago, India issued square and rectangular money. Each "coin" was a metal bar with the value stamped on it. In parts of central Africa, metal money used to come shaped into spearheads. Near the border of ancient China, money was extra useful. It was made into spears and knives. Now that's a sharp idea!

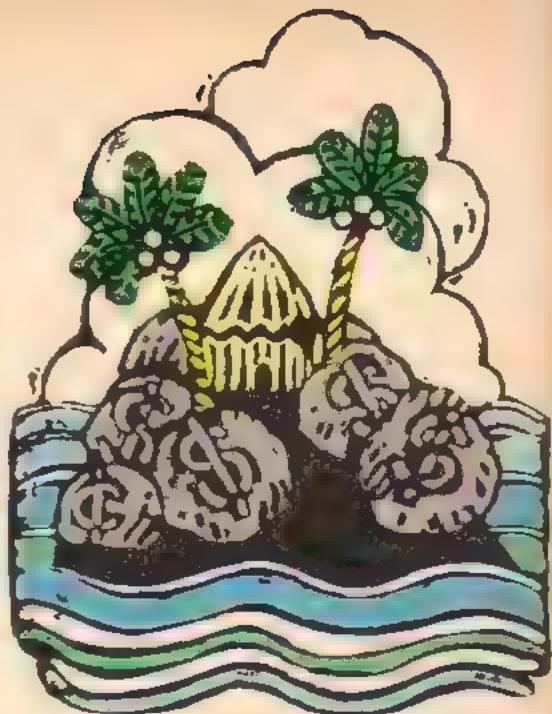
Branch Bank Money doesn't grow on trees. Or does it? There once was a real money tree. It wasn't alive, of course. The money tree was a bronze coin made in China in the 1800s. The name came from the fact that it looked just like a tree. It had a trunk and several limbs. When people needed to make change from a money tree, they just broke off one or two of its branches.



Confusing Coin Ever hear of white gold? This natural mixture of silver and gold was used in staters, the first round metal coins. Made 2,600 years ago, the stater caused lots of confusion. People had been doing business with gold or silver. They had to stop and figure out exactly how much the new coin was worth. If they weren't good in math, it cost them. For some folks, it was simpler to save their money.



Heavy Dough You don't leave money in the front yard. But people in the Yap Islands do. Their money is big round slabs of rock. The largest are 12 feet across. Long ago, the islanders rowed 300 miles to collect their rocks. Then they carved them into money. The biggest coins are most popular. It's not just that they're worth more. They're also harder to steal from the frontyard!



A Lump Sum Salt was once so scarce that it was used as money. Long ago, lumps of salt were used to pay the wages of Roman troops. Their payment was called *salarium*, from the Latin word for salt. Later the word was shortened to *salary*. Using salt for money also led to the expression "not worth his salt." It was used to describe lazy people who did not work hard to earn their money.



Big Bucks When the explorer Marco Polo went to China, he saw paper money for the first time. The Chinese were making money from the bark of mulberry trees. The thin inner skin of the bark was pounded and rolled into sheets that looked like black paper. Many of the bills were giant sized. Each one was as large as a sheet of typing paper. Imagine how big Chinese wallets must have been!



Two Bits A Spanish coin, called a piece of eight, was the first dollar in America. People liked the coin but had trouble making change. Then someone had an idea — cut it into four parts. Each part was a quarter, worth 25 cents. Later, the quarters were cut into two bits, each with a value of $12\frac{1}{2}$ cents. The quarter became known as two bits. That's what the modern quarter is still called.



Any Questions?

Do fish sleep and, if so, do they close their eyes?

All fish need rest, just as you do. Different kinds of fish have different ways of taking a snooze. Some fish sleep on the ocean or lake bottom, resting on their bellies. Others burrow into the sand. Still others float in the water.

But even though fish sleep, they never close their eyes. You could stand in front of a fish tank for hours and never see a fish blink. Is it sleeping or not? You'd never know for sure. Fish don't close their eyes because they can't. They have no eyelids!

So how can a fish fall asleep if it can't close its eyes? A fish's brain shuts out light and allows it to sleep. This is something like what happens to you when you are asleep—not to your eyes, but to your ears. Your ears stay open as you snooze, but your brain shuts out most of the noise.

Question sent in by Melodie Smith, Catoosa, OK.



Why do teenagers get so many pimples?

In a few short years you'll be reaching your teens. You will grow taller and your body will mature. That's good! You will also be faced with the problem of acne. That's bad!

Most of the changes your body will go through are caused by hormones. These chemicals are made inside you. They send signals to different parts of your body and help control what these body parts do.

Hormones control the glands in your skin. These glands release oil which keeps your skin smooth and soft. Hormones in teenagers are very active. They may send too many signals to these glands. The glands give off too much oil. The oil helps block the tiny openings in your skin. The result? Zits!

There is not a whole lot you can do about this. Keeping your face clean will help. But mainly you have to wait until you are older. As the hormone activity slows down, your skin clears up.

Question sent in by Christa Storey, New York, NY.

Do you have a question that no one seems able to answer? Why not ask us? Send your question, along with your name, address, and age, to:

Any Questions?
3-2-1 CONTACT
P.O. Box 599
Ridgefield, NJ 07657

How does the earth get its atmosphere?

Take a deep breath. Big deal, right? It's only air. But what air! That special mix of gases is what makes life possible on earth.

The earth's atmosphere is a mixture of gases that formed after the earth did. Billions of years ago, the earth was very, very hot. The inside was all melted rock. From this melted rock, chemicals rose to the surface. Some of the chemicals combined to form water. Others kept rising. These became the atmosphere.

At first, there was little oxygen in the atmosphere. Over many millions of years, the amount of oxygen in the air increased.

Today, the earth's atmosphere is made of several gases. It's mostly nitrogen gas. But there's also oxygen, carbon dioxide and argon gas. Because of the pull of earth's gravity, these gases stay put, like a shell surrounding the earth.

Question sent in by Alex Tsotsos, Palm Harbor, FL.



What is the moon made of?

In 1969 people got the chance to find out for sure. Astronauts landed on the moon for the first time. They brought back samples of rocks and soil from the moon's surface.

By studying these different samples, people soon discovered what the moon is made of. The rocks and dirt on the moon are made of almost the same minerals as the rocks and dirt on earth.

There are two main kinds of rocks on the moon. One was formed by crashing meteorites. The other kind is made of tightly-packed moon soil.

In some places, moon soil, which looks like gray dust, is one mile deep. But, even though there is soil there, nothing grows on the moon because there is no water. Oh yes, one other thing the moon doesn't have—green cheese!

Question sent in by Lance Davis, Pueblo, CO.

Sky Signs

SKY CONSPIRACY

1982
April

Jupiter

This month, Jupiter rises around the time of sunset. With a telescope or a good pair of binoculars, it can be seen as a small disk, and its four brightest moons can be seen in a line along its equator. They change position from night to night.

These planets are close to Jupiter this month. Saturn is yellow, Mars is red. A telescope shows Saturn's rings.

Will be seen in the east in the morning. During April, Venus is the brightest planet in the sky. Its color is silvery. Rises at sunset.

Venus

April 21-22 **Full Moon**
Lyrid Meteor Shower

Lyrid Meteor Shower

To see meteor showers, lie on your back in a place that's not near city lights. On a clear, dark night, up to 15 meteors an hour can be seen during the Lyrid meteor shower.

May 1-31 **Venus, Mars, Jupiter, Saturn**
Eta Aquarid Meteor Shower
Full Moon

Venus, Mars, Jupiter, Saturn

Venus is visible in the morning sky, and Mars, Jupiter and

Saturn can be seen in the evening sky.

Best seen just before dawn.

Rises at sunset.

June 1-30 **Venus, Mars, Jupiter, Saturn**
Full Moon

Venus, Mars, Jupiter, Saturn

Venus is visible in the morning sky, and Mars, Jupiter and

Saturn can be seen in the evening sky.

Rises at sunset.

July 1-31 **Venus, Mars, Jupiter, Saturn**
Full Moon
Total Eclipse of the Moon

Venus, Mars, Jupiter, Saturn

Venus can be found in the morning sky, and Mars, Jupiter and

Saturn appear in the evening sky.

Rises at sunset.

July 26 **Delta Aquarid Meteor Shower**
Full Moon

Delta Aquarid Meteor Shower

Can be seen around 2:30 A.M., Eastern Standard Time. A dark and slightly reddish shadow appears at height of the

eclipse. The moon becomes almost invisible.

Up to 20 meteors an hour can be seen on a good dark night.

August 1-31 **Venus, Mars, Jupiter, Saturn**
Full Moon
Perseid Meteor Shower

Venus, Mars, Jupiter, Saturn

Venus is seen in morning; Mars, Jupiter, Saturn in evening. Mars and Jupiter are close together in early August.

Full Moon

Don't miss this one. It's the year's best. It lasts several

days, but Aug. 12 is the peak. Try looking from dusk Aug. 11

until dawn the next morning in the northeast, especially after the first-quarter moon sets around midnight.

August 12

Don't miss this one. It's the year's best. It lasts several days, but Aug. 12 is the peak. Try looking from dusk Aug. 11 until dawn the next morning in the northeast, especially after the first-quarter moon sets around midnight.

August 12

Persied Meteor Shower
Sept. 1-15 **Venus**
Mars, Jupiter, and Saturn
Full Moon
Rises at sunset.

Oct. 1-31 **Mars**
Jupiter
Full Moon
Orioid Meteor Shower
Visible in the evening sky.
Visible in evening twilight until mid-Oct. when it vanishes.
Rises at sunset.
Up to 25 meteors an hour can be seen on a clear night.

Nov. 1 **Full Moon**
Mars
Taurid Meteor Shower
Leonid Meteor Shower
Full Moon
Rises at sunset.
Shows up in the evening sky.
Up to 15 meteors an hour can be seen on a clear night.
These meteors are most easily seen from midnight to sunrise, especially in the early morning hours.
Rises at sunset

Dec. 1-31 **Saturn, Mars**
Geminid Meteor Shower
Ursid Meteor Shower
Venus
Full Moon
Total Eclipse of the Moon
Saturn can be seen in the morning sky, while Mars is visible in the evening sky.
Up to 50 meteors an hour can be glimpsed on a clear night.
This shower averages 15 meteors an hour at its peak.
Visible in the evening sky. Easy to recognize because of its brightness. Often mistaken for a UFO!
Rises at sunset.
Peak of eclipse at 6:28 A.M. E.S.T. Makes most of the eclipse occur after sunrise in the United States.

Jan. 1-31 **Jupiter, Saturn, Venus, Mars**
Quadrantid Meteor Shower
Full Moon
Jupiter and Saturn show up in the morning sky. Venus and Mars in the evening sky.
This shower can be as intense as the Perseids (Aug. 12), with as many as one meteor per minute!
Rises at sunset.

Feb. 1-28 **Jupiter, Saturn, Venus, Mars**
Full Moon
Jupiter and Saturn are found in the morning sky. Venus and Mars in the evening sky.
Rises at sunset.

March 1-31 **Jupiter, Saturn, Venus, Mars**
Full Moon
Jupiter and Saturn are visible in the morning sky. Venus and Mars in the evening sky.
Rises at sunset.

Appears in the morning sky until the middle of the month.
Visible in the evening sky.
Rises at sunset.

Visible in the evening sky.
Rises at sunset.

Visible in the evening sky.
Visible in evening twilight until mid-Oct. when it vanishes.
Rises at sunset.
Up to 25 meteors an hour can be seen on a clear night.

Rises at sunset.
Shows up in the evening sky.
Up to 15 meteors an hour can be seen on a clear night.
These meteors are most easily seen from midnight to sunrise, especially in the early morning hours.
Rises at sunset

Saturn can be seen in the morning sky, while Mars is visible in the evening sky.
Up to 50 meteors an hour can be glimpsed on a clear night.
This shower averages 15 meteors an hour at its peak.
Visible in the evening sky. Easy to recognize because of its brightness. Often mistaken for a UFO!
Rises at sunset.
Peak of eclipse at 6:28 A.M. E.S.T. Makes most of the eclipse occur after sunrise in the United States.

Jupiter and Saturn show up in the morning sky. Venus and Mars in the evening sky.
This shower can be as intense as the Perseids (Aug. 12), with as many as one meteor per minute!
Rises at sunset.

Jupiter and Saturn are found in the morning sky. Venus and Mars in the evening sky.
Rises at sunset.

Jupiter and Saturn are visible in the morning sky. Venus and Mars in the evening sky.
Rises at sunset.

This Quiz Is

On this page are eight birds. None of them is your run-of-the-mill robin. Most of these birds are real. But a couple are flights of fancy. Can you find the two fake birds? Answer on page 37.



This bird lives in South America. Its favorite food is dried tree sap. This is the same sticky stuff from which chewing gum is made. The sap sucker makes a special substance in its mouth, so that its beak will not get stuck closed from chewing gum. The sap sucker's green and brown feathers keep it well hidden in the trees. This disguise keeps the bird safe from the panda bears that like to eat it.



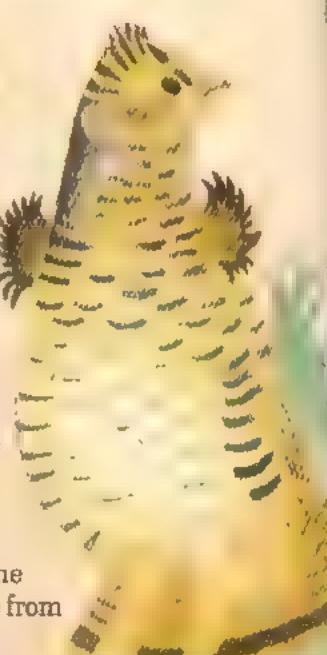
Ever hear of a bird that builds a house instead of a nest? The male bowerbird does! He builds small, roofed structures, called bowers, out of sticks and grass. He uses the house to court the female bowerbird.

But first, the satin bowerbird has to get a mate to come to his little house. So he puts bright objects near the entrance. These might be berries, flowers or even shells.

2. Lyrebird



About the size of a chicken, the lyrebird can imitate the songs of other birds. It can fly, but it uses its wings mostly for balance while running and jumping. The lyrebird lives in Australia. It gets its name from its large and spreading feathers. They are arranged like an ancient harp, which is called a lyre.



The ruffed grouse could be called the "drummer bird." The male is famous for the drumming sound he makes. This sound comes when he beats the air with his wings.

The grouse does not fly south for the winter. Its leg feathers grow longer in the cold weather, to keep it warm. Extra skin grows between its toes, to help it walk on top of the snow. The ruffed grouse gets its name from the thick collar of feathers around its neck, which look like ruffles.



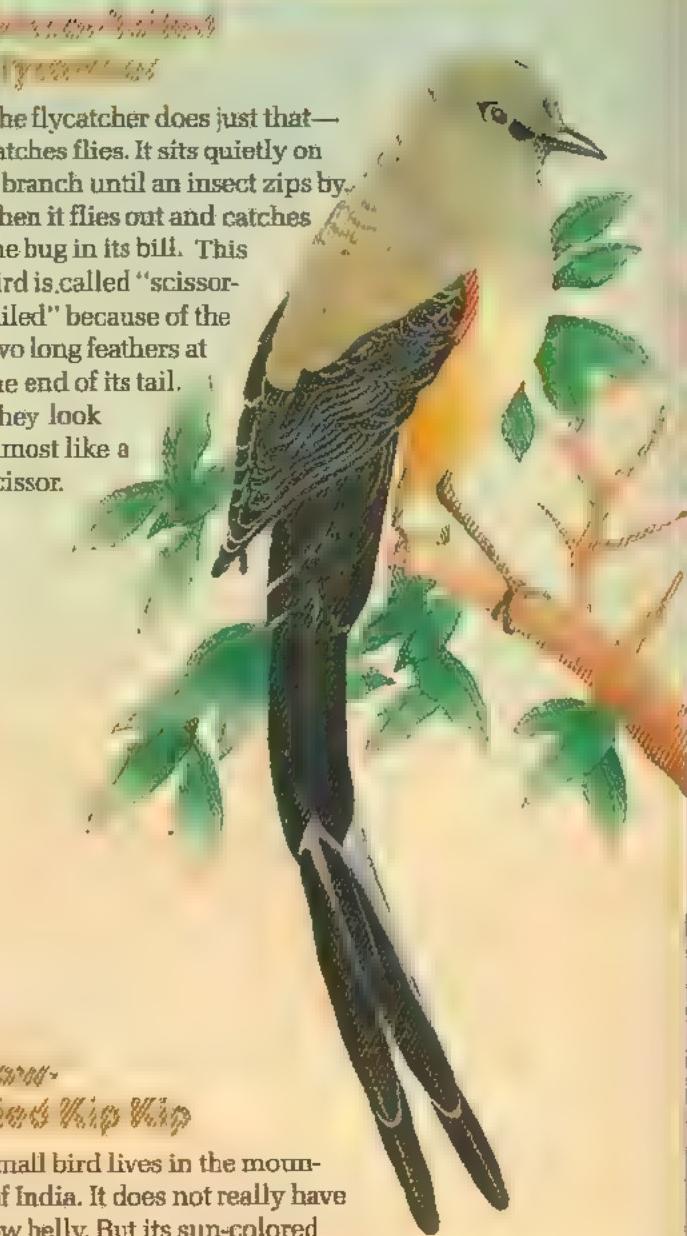
The kiwi is the only bird that uses its beak as a nose. It has nostrils at the tip of its bill. The nostrils help the kiwi to smell food in the thick, wet forest where it lives. Like the ostrich, the kiwi cannot fly. Its wings are too small to hold its weight. This shaggy bird only comes out at night. During the day the shy kiwi hides.



One look at the rhinoceros hornbill tells you how it got its name. Above its bill grows something that looks like a horn. The large bill, which looks too heavy to hold up, is filled with little air cells. They make the bill very light.

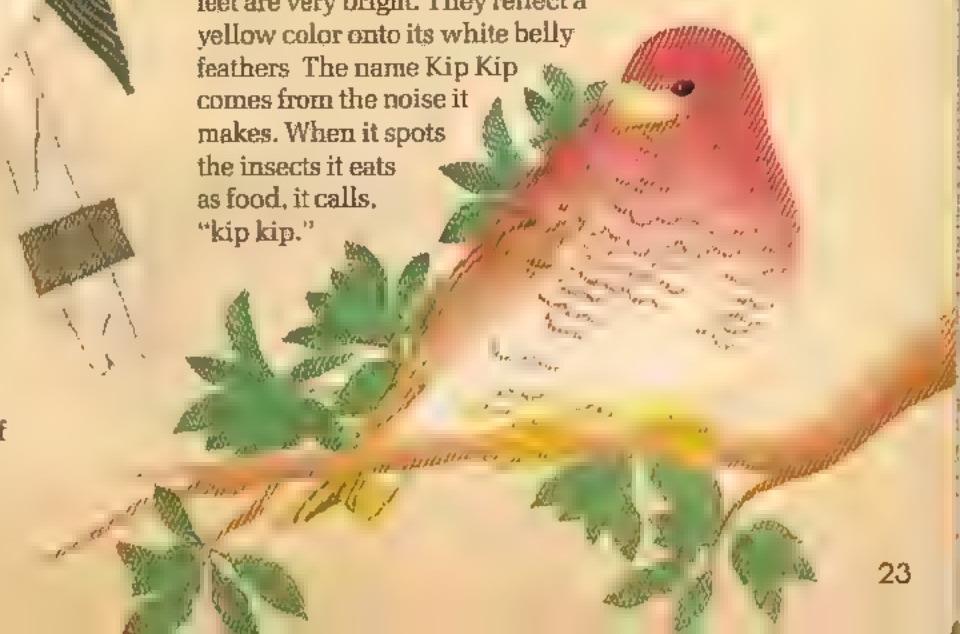
Rhinoceros hornbills live in the tops of trees. They love to eat berries, fruit and insects. Sometimes they eat lizards and other small animals.

The flycatcher does just that—catches flies. It sits quietly on a branch until an insect zips by. Then it flies out and catches the bug in its bill. This bird is called "scissor-tailed" because of the two long feathers at the end of its tail. They look almost like a scissor.



C. Yellow-bellied Kip Kip

This small bird lives in the mountains of India. It does not really have a yellow belly. But its sun-colored feet are very bright. They reflect a yellow color onto its white belly feathers. The name Kip Kip comes from the noise it makes. When it spots the insects it eats as food, it calls, "kip kip."





Spring Special



Exploring

The Early Warning Signs of Spring

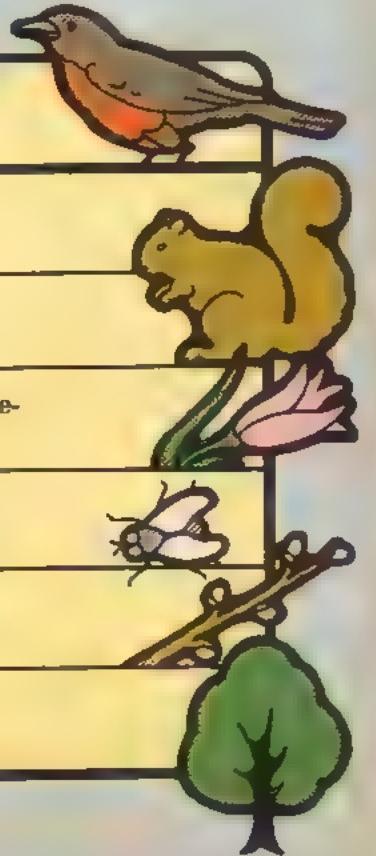
If you check the calendar, you will notice that spring arrives on March 20. Each day after that will have a little more sunlight than the

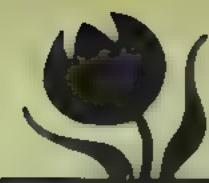
day before.

Actually, the cycles of spring may begin earlier or later than March 20, depending on where you live. Plants

and animals will provide you with some of the first signs of spring. Fill in the dates on this checklist as you watch spring arrive.

DATE SEEN	SIGHT	LOOK FOR
	Migrating birds return.	geese, ducks, robins, sparrows, red-winged blackbirds
	Hibernating animals appear.	toads, frogs, field mice, squirrels
	Spring flowers begin to bloom.	crocuses, snow drops, primroses, blue-bells, violets
	Insects appear.	butterflies (mourning cloak, purple azure), flies, mosquitoes
	Green plants start growing.	pussy willow, fern, skunk cabbage
	Buds appear on trees.	willows, swamp maples, birch

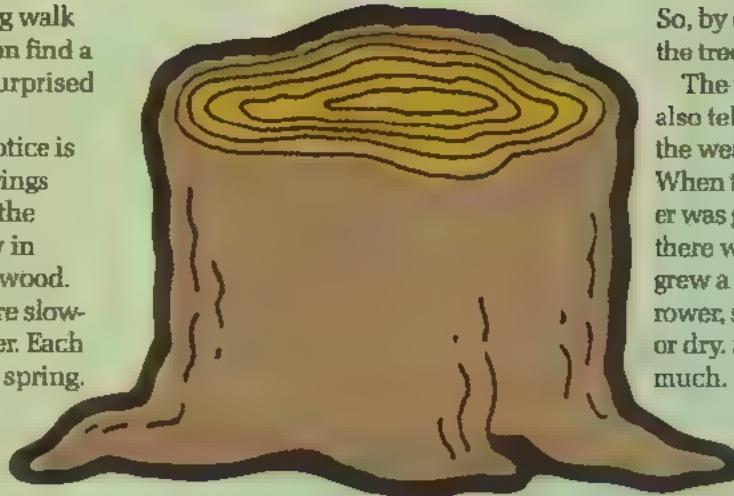




Reading the Rings

During your next spring walk in the woods, see if you can find a tree stump. You may be surprised at what it can tell you.

The first thing you'll notice is the pattern of wide light rings and dark narrow rings in the wood. Trees grow quickly in spring and produce light wood. In summer they grow more slowly and their wood is darker. Each light band represents one spring.



So, by counting them you can tell the tree's age.

The width of the light rings also tells you something about the weather during past springs. When they're wide, spring weather was good. The days were warm, there was lots of rain and the tree grew a lot. Where they are narrower, spring was probably cold or dry. So the tree didn't grow as much.

A Bicycle Built for You

Now that spring is here, you can hop on your bike and just speed away, right? Not so fast! Your bicycle has been sitting around all winter. Before you go zooming off, make these important safety checks.

All brakes work well.

Tire valves don't leak.

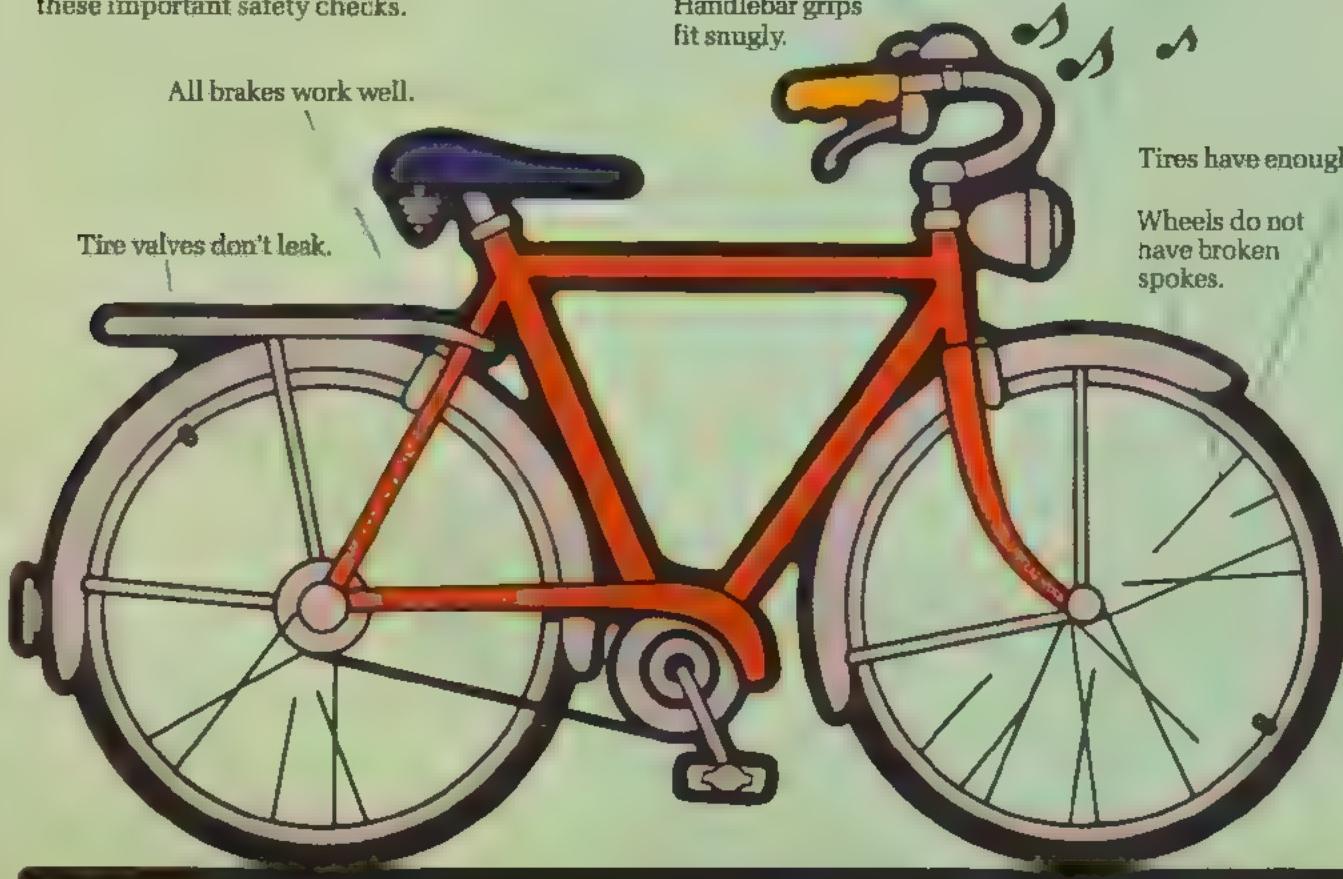
Bell rings or horn honks.

Headlight and reflectors work properly.

Handlebar grips fit snugly.

Tires have enough air.

Wheels do not have broken spokes.





Animal Life



What? No Jelly?

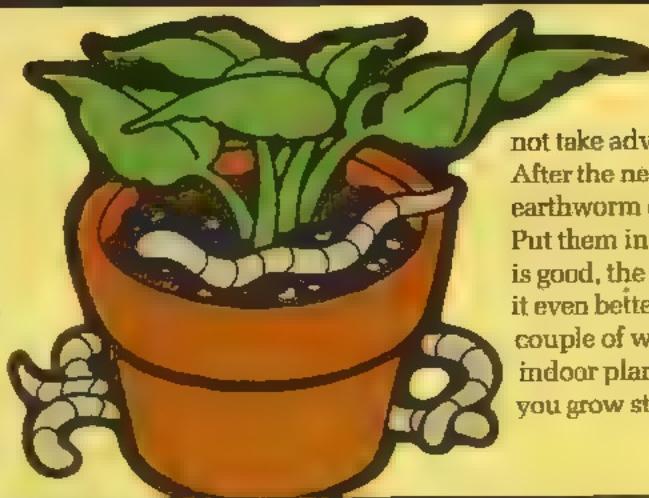
As they migrate, birds burn up a lot of energy. They must eat a lot in order to keep going. You can help feed your fine-feathered friends on their journey. All you need is peanut butter, bird seed, a pine cone and some string. (If you don't have a pine cone, use a scrunched up piece of aluminum instead.)

Spread the peanut butter all over the pine cone. Then dip your gooey pine cone in bird seed. Tie the string to one end of the cone. Then hang the pine cone on a tree. Birds will eat the seed and the peanut butter, too. Wonder if it sticks to the roof of their beaks?

Yuk and Double Yuk

April showers bring May flowers...and earthworms. After a heavy spring rain the sidewalk near your house may be covered with these slimy little critters. The rainwater floods their underground homes. So the worms must come to the surface to breathe.

Instead of being grossed out, why



not take advantage of the situation? After the next heavy rain, go out earthworm collecting. Pick up a few. Put them in your garden. If the soil is good, the earthworms will make it even better. You can even put a couple of worms in the pots of your indoor plants. The worms will help you grow strong, healthy plants.

A Butterfly Is Born

What's better than a pretty moth or butterfly? Finding a cocoon and seeing that moth or butterfly hatch.

Cocoons can be found on leaves, branches, and shrubs. You can find them on fences, window sills or the inside of your garage. Look for them under stones on the ground, too.

If you find a cocoon on a twig, leave it attached and cut the twig from the tree. If you remove a cocoon from bark or a stone, be very gentle.

Keeping a Cocoon

1. Find a glass jar with a wide

mouth. Put a branch in the jar, so that when the moth comes out of its cocoon, it will have something to hang on to.

2. Carefully place the cocoon in the jar. Cover the opening with gauze or wire screening. The wire will protect the cocoon from animals that might eat it.

3. If you can, leave the jar outside in a safe spot. A porch is a great place

4. When the moth appears, leave the lid opened so it can escape back to where it really belongs.



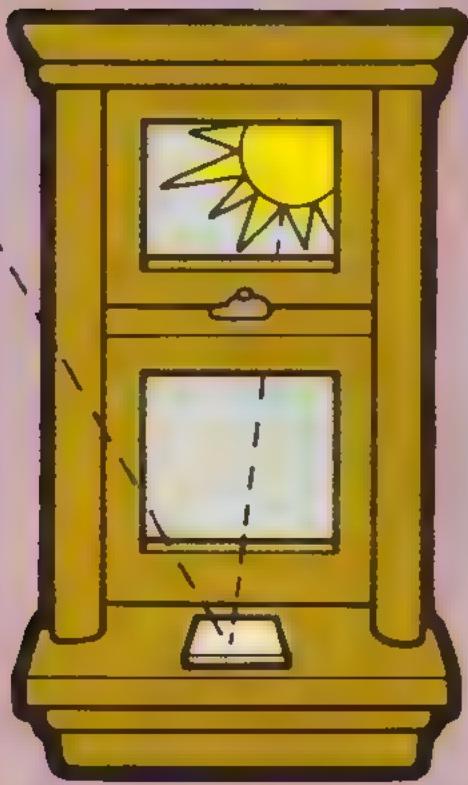
Weather

Follow the Sun

As spring passes, the sun's position in the sky changes a little each day. It's hard to notice this slight difference. But here's a way to watch this steady change.

Tape a small mirror to your window sill. The sun will strike the mirror. A spot of light will reflect on the ceiling. Look and see where it is at noon. Keep checking every few days at the same time. You will notice the spot of light moves slowly across the ceiling.

Of course, the sun isn't moving. It's the earth's orbit around the sun that causes the change. In the spring, the earth's orbit brings the northern half of the planet closer to the sun. This makes the days longer. It also places the sun higher in the sky, where it can send us more heat.



Go Fly a Kite!

Strong March winds make early spring a great time for kite flying. If you can't keep your kite in the sky, there may be more than one problem. It could be the weather, the tail or even how you are handling the kite. Here are some tips that will help you get it off the ground.

1. Measure how tall your kite is without the tail. Now measure the tail. Is it five times longer than your kite? If it's not, that could be the problem. Just add some more material to the tail until it is the right length.
2. Sometimes there just isn't enough wind to lift your kite. The perfect wind speed is 10 m.p.h. Look at a tree. If its leaves are rustling, you've got perfect kite-flying weather.
3. If your kite drops, pull it in very quickly until the string is tight again. To make the kite go higher, let the string loose again. Then pull it in quickly. Keep doing this until the kite is at the height you want it to be.

Cloud Clues

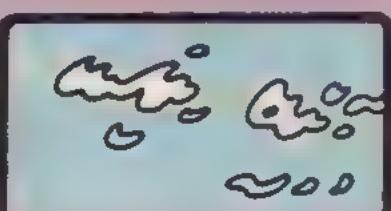
Wind isn't the only thing that can tell you about the weather. So can clouds. When clouds look a certain way, you can figure out what the weather will be. Here are examples.



CUMULUS These white, puffy clouds mean clear, dry weather.



CUMULONIMBUS These are thick, dark, puffy clouds. As they approach, it gets very windy. They bring heavy rain showers, lightning, thunder and sometimes hail.



CIRRUS These are delicate and feathery. Often they appear on bright, sunny days. But don't be fooled! They are a sign of changing weather. Stormy weather may be on the way.



STRATUS Grey sheets of stratus make the sky look dark and gloomy. They can bring showers or long, heavy rains. Fog is formed by stratus clouds that are near the ground.



You're So Vane!

March wind isn't only good for kites. In the past, people used the direction the wind blew to predict what kind of weather was on the way.

Want to try a little old style weather forecasting? First, make this weather vane.

You'll Need

wire hanger	small plastic container
tape	scissors
aluminum foil	crayon
sand	

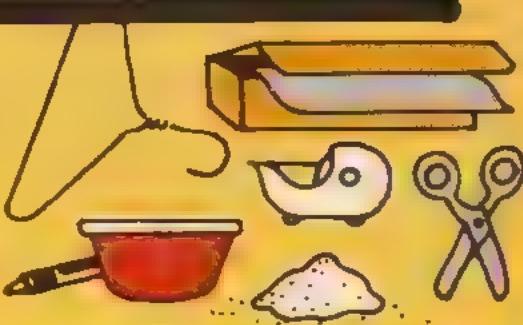
What To Do

1. Straighten out the hanger's hook.
2. Cover half of hanger with foil. Cut the foil a bit wider than the hanger. Fold edges and tape.
3. Mark N, S, E, W on the container as you see in the picture.

4. Fill the container with sand. Put on the lid.

5. Put a hole in the middle of the lid with the end of the hanger.
6. Stick the hanger through. It should touch the container's bottom and turn freely in the hole.
7. Put it outside with N facing north. The open half of the vane shows where the wind is coming from.

Read your weather vane every day. Keep a chart of your readings. Write down the wind direction and also what the weather is like at the time. After a few weeks, you should start to see a pattern. What's the weather usually like when the wind is from the east? From the north? What happens on days when the wind changes direction? Compare your predictions with a local weather forecaster. You may be surprised at how well you can do.



Planting



It's the Pits

Here's a peachy idea for adding a few unusual plants to your spring garden. Whenever you eat a piece of fruit, save the pit or a few of the seeds. Once you have a nice assortment try to turn your seeds and pits into plants. Here's what you must do:

What You Do

1. Soak the different seeds overnight in a little water
2. Line a shallow pan with pebbles. Put a one-and-a-half inch layer of soil on top.
3. Plant seeds about one quarter inch deep and one inch apart.
4. Wet the soil and cover the pan with plastic wrap. Put the pan in a

sunny place. Make sure the soil stays moist.

5. Watch for your first sprouts. You'll have to be patient, though. Some seeds, like grapefruit or orange seeds, can take weeks to sprout.
6. When the plants are an inch tall, move them to larger pots and take good care of them.

If you are lucky, you will end up with some pretty plants. But don't expect to be picking oranges in your living room. The flowers of many plants and trees must be dusted with pollen in order to grow. This happens outside, when insects and the wind spread pollen from one plant to another.





Sponge Garden

Sitting in your kitchen are all the ingredients you need to make a strange little garden. No kidding!

First take a look at your spices. See if you have any spices that are whole seeds. Spices that sometimes come in this form include mustard, dill, sesame, caraway, coriander and cumin.

Take the different kinds of seeds and soak them in water overnight. Then sprinkle them on a wet, clean sponge. Put the sponge in a warm, dark place. Take a look after a couple of days. Little plants should begin to grow, right out of the sponge! Move the sponge to a warm sunny spot and keep it moist. The plants will continue to grow.



What's Up Doc?

Even if you don't have any seeds in the house, you can still grow some great plants. Probably the weirdest is the upside-down carrot.

1. Cut off the bottom two thirds of a carrot. Eat it or feed it to your rabbit.
2. Using a knife, dig out the center of the top. Scoop out enough carrot so that a small hole is formed in the center.
3. Poke three toothpicks into the carrot. Use these to rest your carrot on an empty glass.
4. Fill the hole in the carrot with water. Put the glass in a sunny window. After a few days a green plant should start growing.

Once the vines start growing, turn the plant every few days. That way all the parts get enough sunlight.

A Corny Idea

Inside every kernel of corn is a plant waiting to pop out. But don't take our word for it. You can see for yourself.

What You Need

a few kernels of corn	cotton balls
a paper towel	water
a glass with smooth sides	

What You Do

1. Roll the paper towel to fit inside the glass. Trim off the top.
2. Pick a few kernels from a raw ear of corn. Put the corn between the glass and the paper. Fill the center with cotton
3. Wet the paper towel and the cotton. They should be damp, but not soggy. Then put the glass in a dark place.
4. Check on your corn every day. Make sure the towel stays damp.
5. When the corn sprouts, move it into the sunlight. The leaves will keep growing.



Timeline



The abacus is great for adding, but is not a true calculator.

History of Pocket Calculators

by Douglas Colligan

Past

For thousands of years, people have been using gadgets to help them with their arithmetic. The first of these was the abacus. Rows of beads were attached to a series of wires. By sliding the beads up and down, you could add and subtract quickly. In some parts of Japan and China, people still do their adding on an abacus.

The abacus is a counting machine, but it is not a true calculator. With an abacus, a person does the adding. With a calculator, the person just feeds in the numbers. The machine does the adding.

The first machine that could calculate was built in 1624, by a Frenchman named Blaise Pascal. His father was a tax collector. Mr. Pascal often stayed up late at night adding long rows of numbers. His son built a machine that did the adding and subtracting for him. This calculator was as big as a shoebox. It had dials you turned to feed in the numbers. Once you did this, you could read off the answer.

About 200 years later, an English inventor named Charles Babbage designed an even better machine. He called it the "analytical engine." This gadget could add, subtract, multiply and divide. It could even "remember" the numbers you fed into it. But, Babbage's calculator was hard to construct, and only one was ever built.

Charles Babbage's analytical engine was not just a machine. It was a computer. And that's what today's pocket calculators are—small computers.

The first modern computer was built about 30 years ago. It was called ENIAC. In one second, it could do about 5,000 addition problems. ENIAC was hardly pocket-sized, unless you happened to be the Jolly Green Giant. This computer was the size of a small house.

Computers have gotten better and better since ENIAC was built. Now some computers can do 36 million additions every second. Today, computer parts can be

made much smaller, using computer chips. The thousands of parts needed to make giant ENIAC can now be made to take up as much room as two postage stamps!

With these tiny chips, calculators are made small enough to fit into watches and pens. They can also be made to do more things than ever before. There are calculators that tell time, remember dates and play music. You can buy a calculator to play electronic games or translate foreign languages. If you don't like reading numbers, you can even get a calculator that will talk to you!

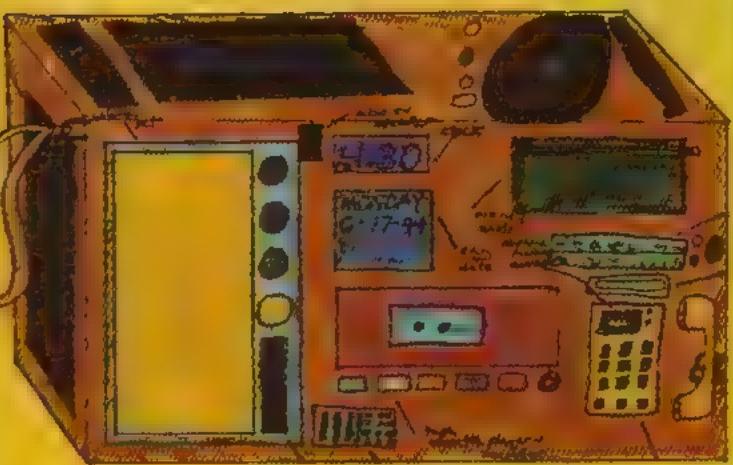
TimeLine



This pocket-sized calculator is also a pen.

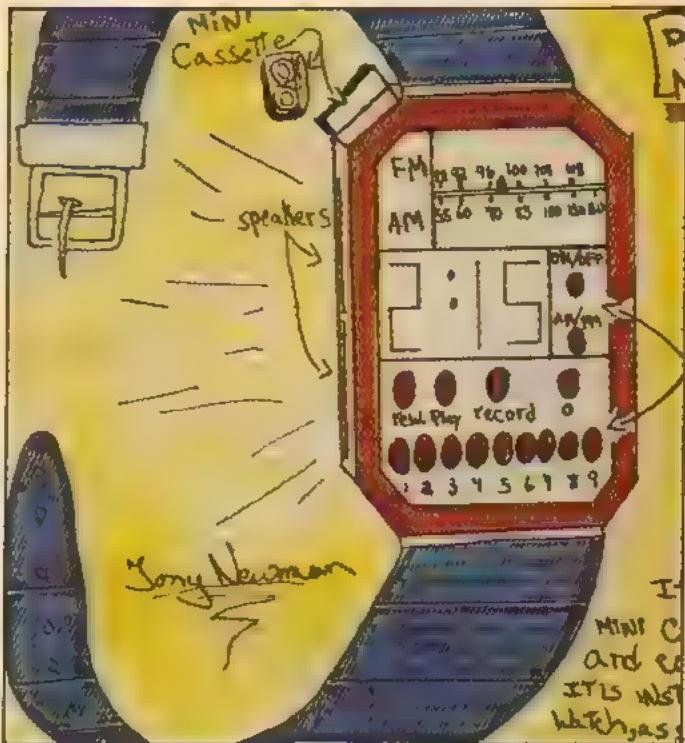
MAIL PO

Future Radios Thanks for sending in your future radios. They were great. Here are some of our favorites.



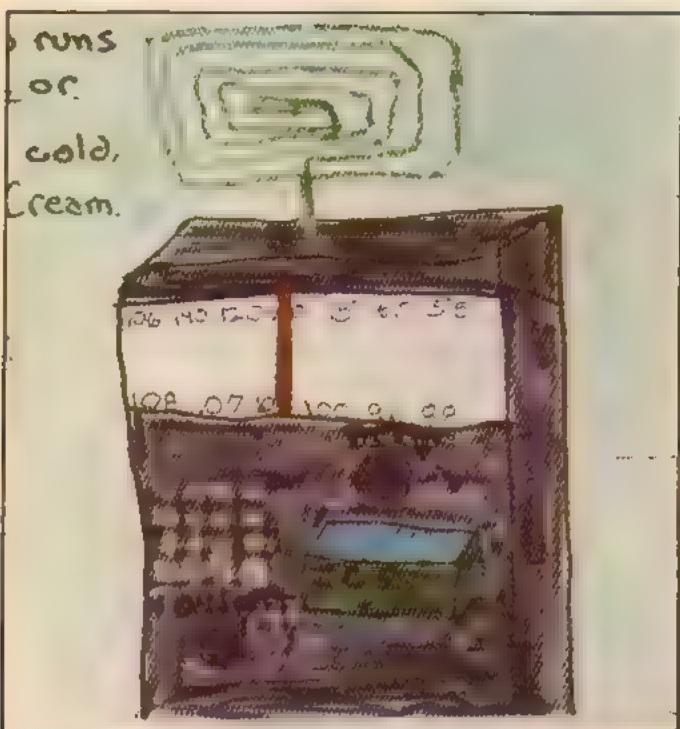
Jill Pollock, New York, NY.

Jill's radio has a record player and telephone.

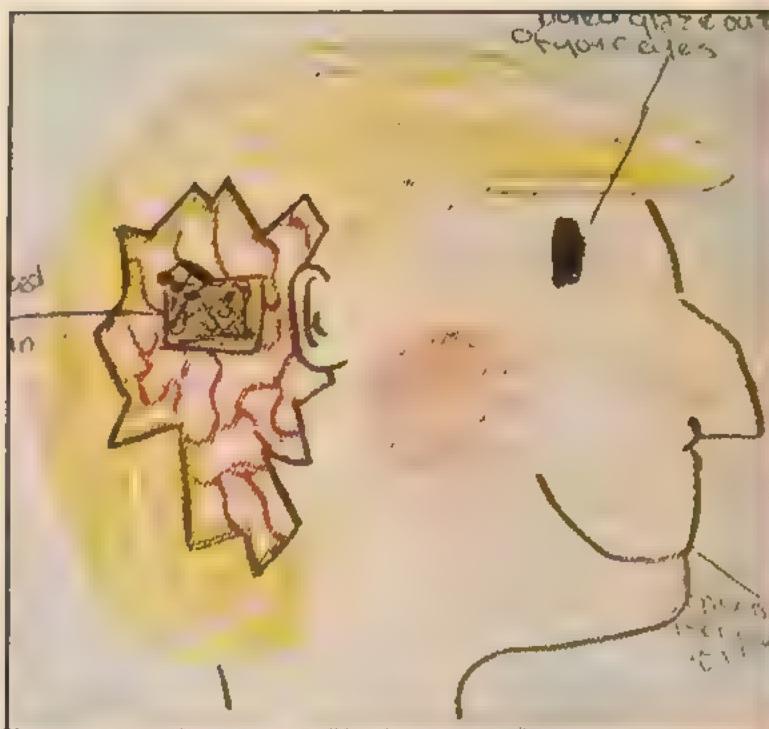


Tony Newman, St. Louis, MO.

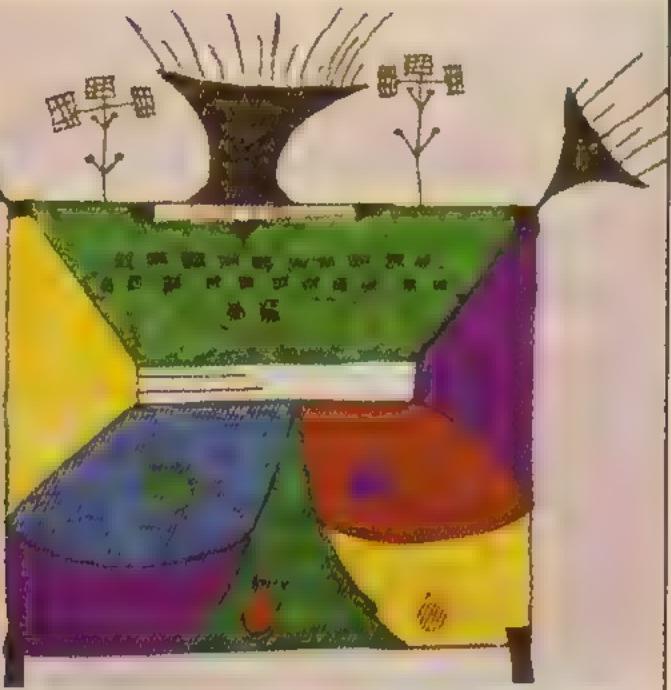
Here is the Radio Watch of the Future.



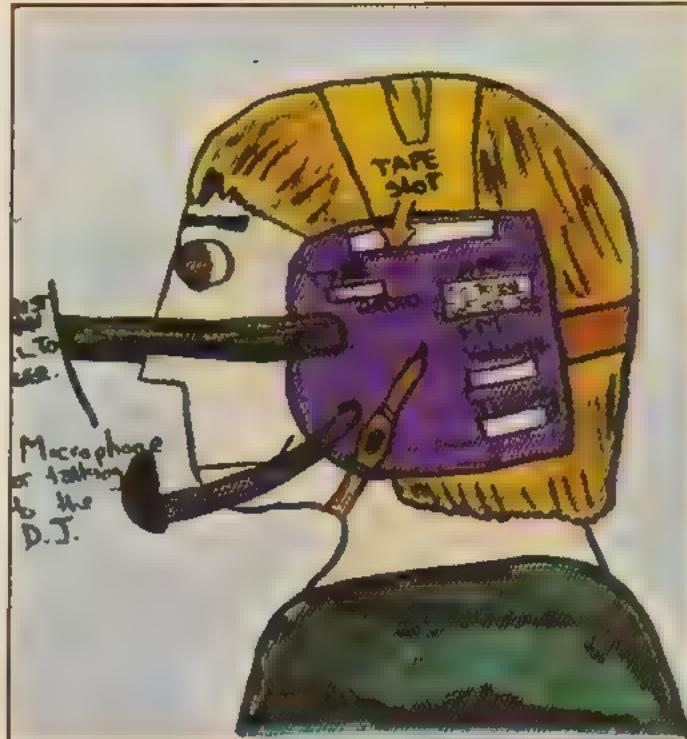
Lara Freda, North Lauderdale, FL.
Lara's radio runs on ice or ice cream.



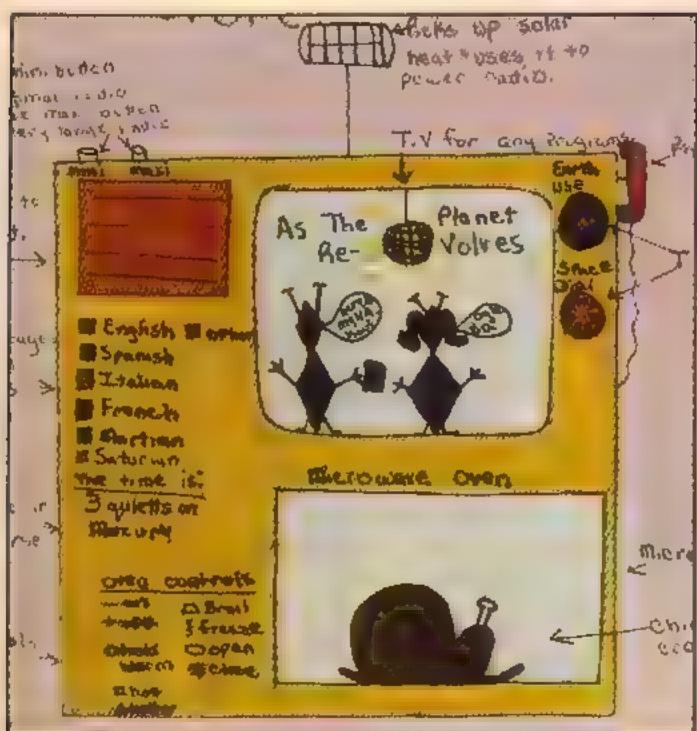
Denise George, Buffalo Grove, IL.
This radio is implanted in your brain.



Charis Burhenn, Midland, GA.
This radio plays music from all over the world.



Amy Lewis, Chatham, NJ.
Talk to the DJ with this headphone radio.



Lisanne Delgado, Brooklyn, NY.
This is a solar-powered radio.

Timeline

Send Us Your Future Calculators

This month you found out about calculators of the past and present. What will the calculator of the future be like? Will you talk to it instead of pushing its buttons? Will you wear it as a ring? Maybe math books will come with an extra page that is really an ultra-thin calculator. Tell us what yours will do. Our favorites will get T-shirts. Send your drawing, with your name, address and T-shirt size to:

Timeline: Calculators
3-2-1 CONTACT
P.O. Box 599
Ridgefield, NJ 07657

Reviews &

Here are some books to read and some things to do and see after reading this issue of 3-2-1 CONTACT.

A Yard of Sound

In the Bloodhound Gang, Zack explained how sound waves travel through air. But sound waves travel through other objects, too. Try this with a friend. You need a watch and a yardstick.

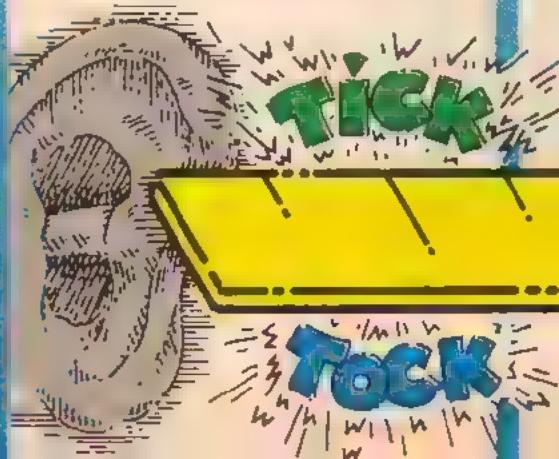
1. Have your friend hold the ticking watch about three feet from your ear. You can't hear the ticking.

2. Now have your friend put one end of the yardstick against your ear, and lay the watch on the other end. Listen very carefully. You should hear the ticking.

In step #1, the sound passed through the air, but was not strong enough to reach your ear. In step #2, the ticking wasn't louder. But because wood carries sound waves better than air, you could hear the watch.

It's a Twister!

Earth Works is about tornadoes—one of the world's most dangerous kinds of storms. There are lots of books you can read on twisters and other storms. Here



are some to look for:

Storm Alert: Understanding Weather Disasters Tornadoes aren't the only kind of weather that can be dangerous. There are also hurricanes, thunderstorms, floods and landslides. In this book, Thomas Aylesworth tells how each weather disaster starts. He also tells you what to do if you're ever caught in any of them! *Storm Alert* is a Julian Messner book.

Storms—From the Inside Out How do thunderstorms form? What causes lightning? Why do hurricanes and tornadoes start spinning? These are some of the questions Malcolm Weiss answers in this book. It is published by the Julian Messner Company. **The National Weather Service** Melvin Berger's book takes a close look at the people who forecast our weather. You'll meet all kinds of weather scientists—including radar operators, hurricane hunters, forecasters and tornado watchers. The book is published by John Day.

What Does A Meteorologist Do? Here's a good book for anyone who might want to be a weather scientist someday. Grant Compton gives you information on the many different jobs meteorologists do and the kinds of places they work. You'll also find out what you will need to learn and what you should do to get started in meteorology. This book is published by Dodd, Mead and Company.

Free Money Facts

Now you know how coins are made. But what about paper money? All of the green stuff is made at the Bureau of Engraving and Printing in Washington, D.C. They also make all U.S. postage stamps. A free pamphlet called "Production of Government Securities" tells how it's done. It's not easy reading. But if you poke through it, you can find some pretty interesting facts. For your copy, write to:

Bureau of Engraving
and Printing
Department of the Treasury
Office of Public Affairs
14th & C Sts., S.W.
Washington, D.C. 20228



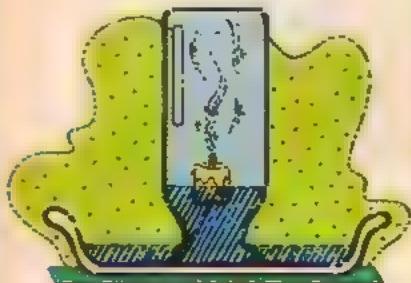
Previews



It's a Gas!

In *Any Questions?* you read about the gases in the atmosphere. To find out a little more, try this activity. You will need a dish of water, a glass jar, a small candle, and a match.

1. Float the candle on the sur-



face of the water in the dish.

2. Carefully light the candle.

3. Place the jar upside down over the floating candle.

4. After a few seconds, the candle will go out and the water will rise in the jar.

Fire needs oxygen gas to burn. The candle flame goes out after it has used all of the oxygen trapped in the jar. The used-up oxygen leaves empty space in the jar. Greater air pressure on the outside pushes water up into the jar to fill the empty space.



Dinosaur Birds and Mummies!

This review was sent in by Stephen Jones, Rainsville, AL. The Anniston Museum of Natural History is in Anniston, Alabama. It's a very interesting place. It has an exact copy of a prehistoric dinosaur bird and an Egyptian mummy. There are stuffed animals and things from many cultures.

The animals are set up in places like their natural habitats. There are birds, insects, extinct animals, sea animals, jungle animals and desert animals.

There are also many things from African cultures. They show tools they use, the way they look, the pottery they make, the jewelry they make, the clothes they make and lots more. You'll enjoy it!

Have you visited a science museum lately? Why not write a review for *3-2-1 CONTACT*? If we use yours, you'll get a *CONTACT* T-shirt. Send your review of 100 words or less, with your name, address and T-shirt size to:

3-2-1 CONTACT
Museum Review
P.O. Box 599
Ridgefield, NJ 07657

3-2-1 Contest

You've just seen some pretty unusual creatures in this month's bird quiz. Well, imagine you're walking in the woods. You spot an unusual bird—a kind that has never been seen before.

Draw a picture of this bird and write a short description. Be sure to tell us the bird's name and how it lives. The people who send the most interesting and unusual birds will get T-shirts. So, send your drawing and description, plus your name, address and T shirt size to:

3-2-1 Contest: Birds
P.O. Box 599
Ridgefield, NJ 07657

2nd



TICK

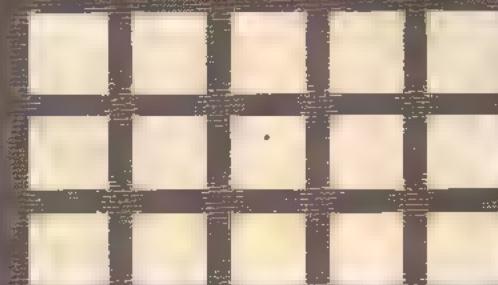
Do It!

Calculator Puzzles



123

4567



2. All the numbers on your calculator, except 6, can help you spell words. When read upside-down they look like the following letters:

1 I	4 H	8 B
2 Z	5 S	9 G
3 E	7 L	0 O

Your calculator can be friendly. Solve this problem and turn your calculator upside-down to see what $.03867 \times 2$ spells.

3. Here are a few more calculator words to figure out. Turn your calculator upside down for each answer.

- A. $106,000 \div 2 + 45$
- B. $2 \times 4,000 + 75$
- C. $98,659,005 - 21,313,012$
- D. $0.2373 \div 3$
- E. $1,793,303 \times 3$

Answers on page 37.

Did It!?

Answers

Bird Quiz (page 22)

The fake birds are 1. Gum-Chewing Sap Sucker and 8. Yellow-Bellied Kip Kip.



Next Month!

Here's a sample of what you'll find in the next issue of 3-2-1 CONTACT:

Wildlife of the Desert

Find out how animals manage to survive in the hot, dry desert.

Bloodhound Gang

Part Two of "The Case of the Whispering Pirate."

Poster

A big color picture to hang on your wall.

Plus Factoids, Mail, Earth Works and Much More!

Calculator Puzzles (page 36)

- | | |
|--------------|-----------------|
| 2. HELLO | C. EGGSHELL |
| <i>HELLO</i> | <i>E665HELL</i> |
| 3. SHOES | D. IGLOO |
| <i>SHOES</i> | <i>I6L00</i> |
| B. SLOB | E. GOGGLES |
| <i>SLOB</i> | <i>6066LES</i> |

Credits

COVER: (TOP LEFT) PHOTO © ANDREW POPPER; (TOP RIGHT) ILLUSTRATION © JOHN NEZ; (BOTTOM LEFT) ILLUSTRATION © DENNIS ZIEMIENSKI; (BOTTOM RIGHT) ILLUSTRATION © SHIRLEY KANEDA; P. 2: PHOTO COURTESY OF NASA; P. 4-7: PHOTOS © ANDREW POPPER; P. 8-9: ILLUSTRATIONS © JOHN NEZ; P. 10: (TOP) PHOTO, BRUCE COLEMAN, INC./© NICHOLAS DEVIRE III; (BOTTOM) PHOTO COURTESY OF THE U.S. COAST GUARD; P. 11: (TOP) PHOTO COURTESY OF ROY CALDWELL; (BOTTOM) PHOTO COURTESY OF TRILLING RESOURCES; P. 12 & 14: ILLUSTRATION © NEIL WALDMAN; P. 15: ILLUSTRATION © N. JO SMITH; P. 16-17: ILLUSTRATIONS © BARBARA HAMLIN; P. 18-19: ILLUSTRATIONS © DENNIS ZIEMIENSKI; P. 20-21: ILLUSTRATION © MARIA LUKAC; P. 22-23: ILLUSTRATIONS © SHIRLEY KANEDA; P. 24-29: ILLUSTRATIONS © SHELLEY THORNTON; P. 30: ILLUSTRATION © BRAD HAMANN; P. 31: PHOTO © AEROGRAFICS/RICHIE WILLIAMSON & DEAN JANOFF; CALCUPEN COURTESY OF VICTOR WYLER TIME, WHITE PLAINS, NY; P. 34-35: ILLUSTRATIONS © ELLIOT KRELOFF; BACK COVER: PHOTO, NATIONAL SEVERE STORMS LABORATORY/© LEO AINSWORTH.

Oops!

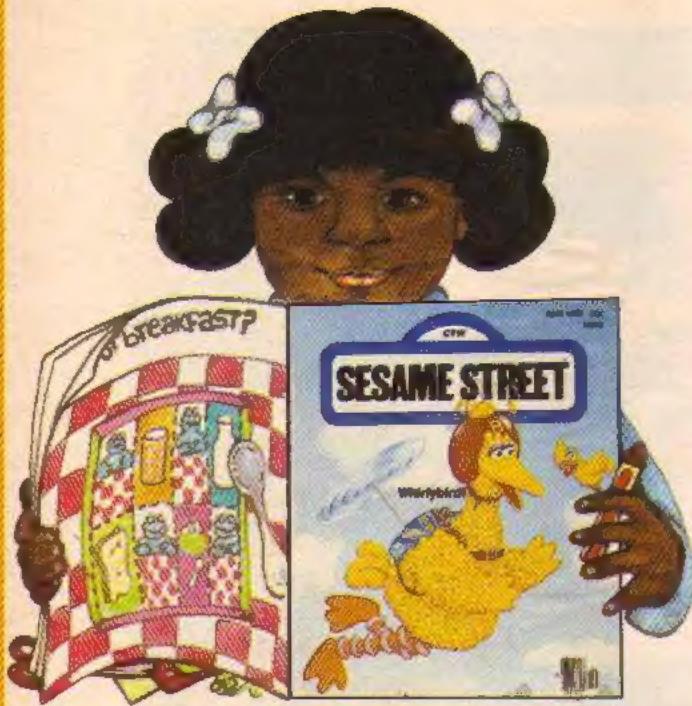
In the September, 1981, Factoids we goofed. Bamboo is not a tree. It is a grass. Thanks to those of you who caught our mistake.

Thank You!

Special thanks to Melanie Furgal for her help in preparing this issue.

Enjoy Sesame Street

For Ages 2-6



Sesame Street Magazine — Big Bird and his delightful friends will bring dozens of playful surprises, ten terrific times a year. (It's the entertaining education that Sesame Street does best!) Puzzles, cut-outs, games, A-B-C's, 1-2-3's...there's all the magic of the TV super-series in every colorful issue.

Entertain with The Electric Company

For ages 6-10



The Electric Company Magazine — as creatively entertaining as the T.V. show kids love. It's amusing, playful, absorbing and educational for beginning and young readers.

Enjoy ten colorful issues filled with puzzles, posters, cut-outs, Spidey super stories, jokes...and sunny smiles.

Sesame Street Order Form

Yes! Please send 1 year (10 issues) of Sesame Street for only \$7.95

I prefer 2 years (20 issues) for only \$13.95.

Best Buy
CHILD'S NAME _____ AGE _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

LIST BILLING NAME AND ADDRESS IF DIFFERENT FROM ABOVE

Bill me later Payment enclosed

Check here if this is a renewal

Subscriptions to Canada and other countries \$11.95 per year.
Please remit in U.S. currency.
Allow 4-6 weeks for delivery.

MAIL TO: Sesame Street Magazine
P.O. Box 2894, Boulder, CO 80322

8CT45

The Electric Company Order Form

Yes! Please send 1 year (10 issues) of The Electric Company for only \$7.95

I prefer 2 years (20 issues) for only \$13.95.

Best Buy
CHILD'S NAME _____ AGE _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

LIST BILLING NAME AND ADDRESS IF DIFFERENT FROM ABOVE

Bill me later Payment enclosed

Check here if this is a renewal

Subscriptions to Canada and other countries \$11.95 per year.
Please remit in U.S. currency.
Allow 4-6 weeks for delivery.

MAIL TO: The Electric Company Magazine
200 Watt Street, P.O. Box 2922, Boulder, CO 80322

8CT45

Earthfacts: Tornadoes

by Marilou Carlin

Each month CONTACT will bring you another Earth Works. Save these pages in a notebook. Soon you will have your own guide to the wonders of the planet Earth.

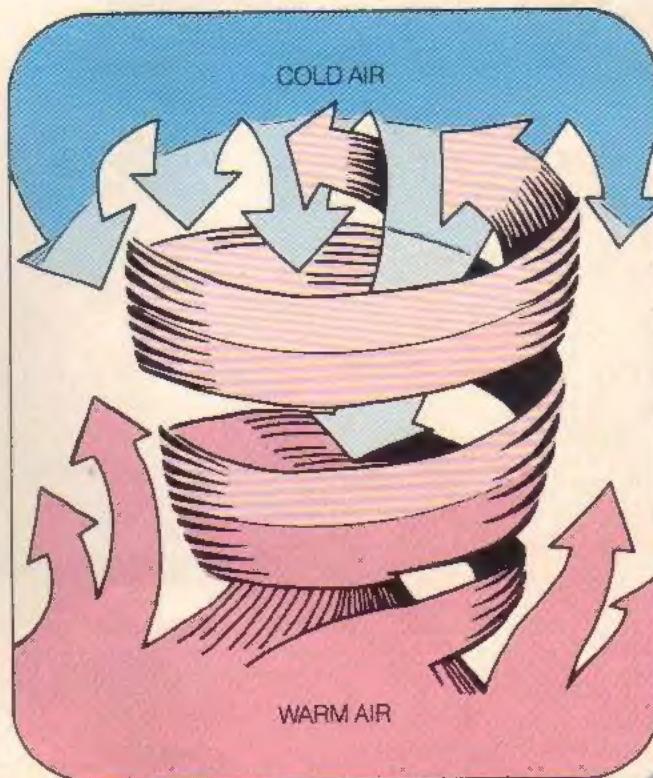
- ➊ Tornadoes have the strongest winds on earth. They whirl around at more than 300 miles per hour. And in the center of a tornado, air can move as fast as a jet plane—500 miles per hour.
- ➋ A tornado starts when warm, moist air meets cold, dry air. Cold air usually pushes its way under warm air. But not always. Sometimes cold air rolls over the warm air. The heavier, cold air that is now on top sinks through the warm air below. The winds spin and whirl around. A tornado is born!
- ➌ With its funnel-shaped cloud, a tornado is also called a twister or a cyclone. When a tornado forms over a lake or ocean, it can pull water up into its funnel. This giant column of water is called a waterspout.
- ➍ As swirling tornado clouds reach towards the ground, they make a hissing sound. Once the storm touches the earth, the hissing becomes a roar.
- ➎ Tornadoes are more than just masses of furiously spinning wind. Rain, hail, lightning and thunder often are part of the storm.
- ➏ At its widest, a tornado measures about 1,000 feet (300 m) across. At its narrowest point, near the ground, a tornado can be as small as the width of a house.
- ➐ Most tornadoes don't last more than an hour. But during that time they can do more damage than the much bigger hurricanes. The worst tornado ever recorded hit the U.S. on March 18, 1928. It struck Missouri, Illinois and Indiana, leaving 689 people dead.

EarthWorks

➊ About 700 tornadoes strike the United States every year. That's more than any other country in the world. Most American tornadoes hit the Midwest and the states that border the Gulf of Mexico.

➋ Sometimes a tornado makes things explode instead of blowing them down. When it passes over a house, it sucks up the air from around the building. The air pressure outside the house drops suddenly. But the inside air pressure stays the same. The force of the air pushing outward from inside is very great. The building bursts!

Below: This diagram shows you how tornadoes form. Warm air, shown in red, rises from near the ground. Cold air, shown in blue, starts to sink from above. The air masses collide and start to swirl around each other. A twister is born.



earthWorks



Tornadoes

What would you do if you saw this cloud coming toward you? You had better run for cover. This is a tornado! It's small compared to other kinds of storms. But it is so powerful that it can send a car flying through the air or turn over a train.

A tornado looks like a tall funnel. Its winds whirl around and around very fast. A storm like this sometimes works like a big vacuum cleaner. It can suck up anything in its path.

Want to know more about these superstorms? Turn to page 39.

Children's Television Workshop
1 Lincoln Plaza
New York, N.Y. 10023

Nonprofit Org.
US POSTAGE
PAID
Glasgow, KY.
Permit No. 393

440774 ROY 0220P098 044B NOV82

JERRY ROY 03
220 PENN ST DIR
LAKE CHARLES LA 70601